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SYMPTOMLESS INCOMPATIBLE TRANSFUSION AND RESULTANT CHANGES IN ISO-AGGLUTININ TITRE

BY

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Incompatible blood transfusions in which studies of iso-agglutinin titre have been made are not numerous. The number of these mishaps reported in the literature is not a true reflex of their incidence. In the case here reported blood-grouping technique was impeccable. The mishap, mercifully without any consequences, occurred for a different reason—namely, scrupulous care was not taken to see that the correct bottle of blood was obtained from the blood bank. The circumstances were somewhat similar to those in Mollison's (1943) Case 10, in which effete group O blood was given to a group A recipient. After 19 days in cold storage the blood was left on a shelf at room temperature for four weeks. A nurse sent to fetch the blood selected this bottle instead of the correct one in the refrigerator. An hour after transfusion there was haemoglobinaemia but no surviving donor cells. A febrile reaction occurred, but no further sequelae were noted.

Previous Reports

Rö (1937–8) studied a group O recipient who recovered after receiving 500 c.cm. of group A blood. In preliminary tests the recipient's serum did not agglutinate the donor's cells. The biological test of Oehlecker (1921) was negative. Haemoglobinuria, jaundice, and oliguria occurred. Two days later the anti-A titre was 20. It rose to 200 in the fifth week and fell to 70 in the ninth week. A strong anti-A haemolysin was detected. Wiener (1939) and Wiener *et. al.* (1941) studied a group O recipient transfused with 500 c.cm. of group B blood. Rigor and haemoglobinuria resulted. In a few hours the anti-B titre was only 1, but on the thirteenth day it was 512. Wiener (1941) investigated a group B recipient who recovered after receiving 150 c.cm. of group AB blood. Rigor and haemoglobinaemia occurred. Shortly after transfusion the anti-A titre for A_1 cells was 4 and for A_2 cells 0. A peak of 512 was attained on the seventh day against A_1 and A_2 cells. Mollison and Young (1941) observed a group O air-raid casualty transfused with citrated group B blood (content, 360 c.cm. whole blood) and unpooled group A sera. Group O blood and pooled plasma were also given. Recovery occurred after uraemia. Eight hours after the incompatible transfusion the anti-A titre was 128, but some hours later it was only 32. The anti-B titre fell as low as 2. There was a subsequent colossal rise in titres. On the eighth day the anti-B titre was 500,000, and on the eleventh day the anti-A titre was over 65,000. Return to normal was slow. Rise in anti-A titre was due to group A substance in the transfused unpooled group A sera. Agglutinates were present in the recipient's blood for seven days after the incompatible transfusion. A haemolysin acting on A and B cells was observed from the seventh to twenty-fifth days. Anti-M and anti-N were not involved. Rises of anti-A titre to 16,384 and 262,000 were observed by Mollison (1943) in two group O recipients transfused respectively with 45 c.cm. and 1,000 c.cm. of group A blood; both recovered.

Certain workers, apart from those mentioned, used differential agglutination to study the *in vivo* survival of incompatible erythrocytes. Jervell (1924) reported the following cases. (i) A newborn child with melaena neonatorum. It was group O, but the α and β agglutinins were absent. It received 100 c.cm. of group A blood from the mother. The donor's cells survived six weeks. The mother's β agglutinin was detected in the child's serum for two weeks, and attained a titre of 10 on the second day. (ii) A group B female transfused with 600 c.cm. of group O blood and 600 c.cm. of group A blood. After being jaundiced she recovered. All group A cells were eliminated in 12 hours. (iii) A group B female given 550 c.cm. of group O blood and 350 c.cm. of group A blood. She had a severe reaction, and died three hours later. The recipient's serum agglutinated the donor's cells to 1 : 4 and completely haemolysed them in 15 minutes. Blood taken by cardiac puncture 10 minutes after death showed marked haemoglobinaemia and no surviving group A cells. (iv) A 2-year-old child, group O, afflicted with leukaemia, given 200 c.cm. of group A blood. Drowsiness, vomiting, bloody urine, and jaundice occurred. Improvement followed transfusion of 200 c.cm. of group O blood. The group A cells survived three days. In Lauer's (1941) case, immunization of a group O person to cells of another person (group A) occurred in a skin-graft operation. The anti-A titre was 2048 and later fell to 2. Burnham's (1930) patient, group B, recovered after transfusion with 400 c.cm. of group A blood. Symptoms were mild. The recipient's serum agglutinated group A cells at room temperature but not at all at body temperature. The donor's cells survived three to five days. Grove and Crum (1930) investigated a group O recipient transfused with 300 c.cm. of group B blood. No reaction occurred, and this was attributed to inability of the recipient's serum to agglutinate 2% suspensions of A or B cells in test-tubes, after incubation at 42° C. for one hour. The donor's cells were surviving the day after transfusion. The recipient's blood was not further examined till the seventh day, when no donor's cells were found.

Schiff (1924) produced a specific precipitin in rabbit serum against agglutinogen-A substance in human serum. Aubert, Boorman, and Dodd (1942) extended Schiff's work. They injected Seitz-filtered human A or B sera into guinea-pigs or human volunteers, and produced anti-A or anti-B antibodies, some of quite high titre. Alternate responses were produced in a group O subject by injecting first group A and then group B serum. Rises in iso-agglutinin titre after incompatible transfusion, while principally due to agglutinogen of incompatible cells, may therefore in part also be due to agglutinogen substance in solution in the donor's plasma.

Case Report

In the case here recorded the iso-agglutinin changes were studied and an attempt was made to find an *in vitro* explanation for absence of symptoms.

A man aged 54 was admitted to hospital on Feb. 19, 1943, for melaena and loss of weight. He was crippled by chronic rheumatoid arthritis, which was still active. Seventeen months ago he had a course of gold salt injections. Seven years ago he underwent an operation for gastric ulcer. Latterly pain had occurred in the epigastrium after meals and was relieved by taking food. Weight, 8 st. 10 lb.; blood pressure, 120/60; blood count—red cells 4,000,000, leucocytes, 7,600; haemoglobin, 40%; blood group, B and Rh-positive. On March 22 the haemoglobin was 60%.

On March 23 the patient was inadvertently transfused with group A blood under the following circumstances. The local issuing blood depot was requested to supply group B concentrated red cells. After cross-matching tests the blood was issued and placed in the hospital blood bank. The medical officer in charge of the case instructed a nurse to fetch the blood from the refrigerator. A bottle of blood was selected and given to the medical officer. The bottle label was not examined, and transfusion was started at 6 p.m. at a very slow drip rate. Some 5½ hours later it was noticed that the bottle was labelled group A. The patient had complained of no symptoms whatever. Transfusion was immediately stopped. Approximately 460 c.cm. of blood had been transfused. The blood mixture consisted of 120 c.cm. of 2.5% sodium citrate solution, 20 c.cm. of 10% glucose solution, and 400 c.cm. of whole blood.

The blood had been stored for seven days under proper conditions. The remnant of blood in the bottle was checked and found to be group A, and the cells were agglutinated by the recipient's serum, a specimen of which was collected at the time. The recipient's group was confirmed as B. The group B blood supplied for the recipient was still in the hospital blood bank.

No febrile reaction occurred during transfusion, when the pulse was 76 and temperature 97° F. Six hours later the pulse rose to 102 and the temperature to 100° F. However, the patient felt well. The temperature was normal within 12 hours, and thereafter remained normal or subnormal. In 24 hours the pulse dropped to 76. The recipient had run an occasional pyrexia since admission, and the day before transfusion the pulse was 100. On March 24, some hours after transfusion, 300 c.cm. of 2.5% sodium citrate solution was injected intravenously. Potassium citrate gr. 60 was given hourly by mouth till the urine was alkaline. Intravenous glucose-saline was given at a slow drip rate. General condition satisfactory. Over 24 hours the fluid intake was 94 oz. and output 123 oz. Serum bilirubin, 0.1 mg. per 100 c.cm.; icterus index, 3.3. Trace of urobilin in urine.

March 25.—Condition satisfactory. Temperature and pulse normal. Urine normal and no casts or erythrocytes in centrifuged deposit. No haemoglobinuria. The serum of the venous blood was clear; there was neither bilirubinaemia nor haemoglobinaemia. During 24 hours the fluid intake was 149 oz. and the output 125 oz. Intravenous glucose-saline discontinued.

March 26.—I was asked to make investigations. The patient's complexion was ruddy and his general condition good. No jaundice. Closely interrogated as to whether he had felt any untoward symptoms during the transfusion, he replied confidently in the negative. Indeed, he asserted he felt better for it. Ever since admission to hospital he had had a more or less constant dull aching pain in the dorsal region of the back, and in the ankle- and knee-joints. These symptoms had been present for months. Backache was present all day before transfusion and was in no way worse during or after it. The backache was still present months later. Urine normal and nothing abnormal in the centrifuged deposit. Blood urea, 40 mg./100 c.cm.; icterus index, 4; serum bilirubin, 0.1 mg./100 c.cm. Temperature and pulse normal. Although untoward symptoms were absent, it was decided to take anticipatory measures. Transfusion of compatible blood as recommended by Hesse and Filatov (1932) and Hesse (1936) was advised in combination with preliminary phlebotomy of the recipient. Von Deesten and Cosgrove (1933–4) employed phlebotomy with good result for uraemia due to haemolysis after blood transfusion. Withdrawal of 500 c.cm. of recipient's blood was made by venepuncture and promptly followed by transfusion of 540 c.cm. of group B whole blood (stored in mixture already alluded to). No febrile reaction. During 24 hours the fluid intake was 152 oz. and output 125 oz.

March 27.—The patient had some slight transient pain on breathing. Withdrawal of 420 c.cm. of recipient's blood and transfusion of 540 c.cm. of group B blood. No reaction. Blood urea, 32 mg./100 c.cm.; serum bilirubin, 0.3 mg./100 c.cm.; icterus index, 5. Fluid intake 150 oz. and output 103 oz. *March 28:* No untoward symptoms. Withdrawal of 420 c.cm. of recipient's blood and transfusion of 540 c.cm. of group B blood. No febrile reaction. Fluid intake 104 oz. and output 97 oz. It was noted that the plasma of the recipient's blood withdrawn on the previous day had a peculiar slightly greenish tinge. *March 29:* Withdrawal of 420 c.cm. of recipient's blood and transfusion of 540 c.cm. of group B blood. No reaction. Fluid intake 110 oz. and output 107 oz. Urine normal. Haemoglobin, 66%; blood urea, 31 mg./100 c.cm.; serum bilirubin, 0.05 mg./100 c.cm. *March 31:* Condition satisfactory; haemoglobin, 68%. *April 1:* Urine contained a few granular casts and trace of urobilin. *April 2:* Blood urea, 40 mg./100 c.cm. *April 22:* Haemoglobin, 74%; patient left hospital.

He was observed for several months, and except for the arthritis remained well. There are no grounds for assuming that the bleeding of the recipient and transfusions of homologous blood contributed to the favourable outcome.

Special Investigations of Case

Regrettably, in the 48 hours immediately after incompatible transfusion no investigation for methaemalbumin, Schumm's test, or spectroscopy for serum haemoglobin was made. Fortunately a pre-transfusion specimen of the recipient's serum was available at the local issuing blood depot. This specimen was collected the day before the incompatible transfusion. This serum strongly agglutinated the conserved red cells of the donor's blood (now 10 days old). The technique was to mix equal volumes (0.4 c.cm.) of saline, citrated red cell suspension (strength 0.5%), and serum in tubes of 3/8 in. diameter. After standing five minutes at room temperature tubes were centrifuged at 2,000 r.p.m. for two minutes. The groups of recipient and donor were confirmed as B and A respectively. Tests were performed in tubes, and groups were checked on cells and serum. The donor's plasma agglutinated the recipient's cells weakly. The above results likewise obtained at 37° C., whether tubes were stood five hours or centrifuged. The recipient's serum was diluted 1 : 25 (i.e., 1 c.cm. serum to 24 c.cm. saline) and titrated against cells of a standard A donor (subgroup A_1); the titre was 1 : 100 at room temperature.

The titration technique was similar to that of Challinor, Ives, and van Rooyen (1939). Volumes of 0.4 c.cm. were used. Serum dilutions were doubled in saline from tube to tube. Tubes were 3/8 in. by 2 in. The washed citrated fresh red cell suspension was packed by the centrifuge to a strength of 0.5% in terms of cell sediment. The titre was stated as the greatest dilution in which agglutination was observed. Dilution caused by addition of the volume of red cells was taken into account, though many workers ignore this. Tubes, including controls, were stood five hours at room temperature and then examined for agglutination after adequate flicking with the index finger. The end-point observed by the naked eye was noted, and in succeeding tubes agglutinates were sought for by microscopy. Clumps of 3 to 5 cells were taken as evidence of agglutination. The end-point observed by microscopy was invariably one or two tubes, occasionally three, higher than that noted by the naked eye. Tubes were adequately shaken so as to avoid false positive readings. This precaution is necessary, since if a suspension of red cells in citrate or saline is allowed to settle and is then microscoped after inadequate shaking, agglomerates of cells may sometimes be observed. Such agglomerates may be quite large and resemble clumps of agglutinated corpuscles. Too vigorous agitation may, however, eliminate evidence of agglutination in the higher dilutions. Titrations were done in duplicate.

The recipient's serum taken the third day after incompatible transfusion agglutinated the conserved donor cells only to a titre of 1 : 16. Identical results were obtained with fresh cells from the incompatible donor and from a standard A donor (subgroup A_1). Hereafter the titre rose rapidly and attained a peak of 1 : 25,600 on the fifteenth day. The titre fell slowly, and eight months later had not quite approximated the pre-transfusion level (see Fig. 1). In

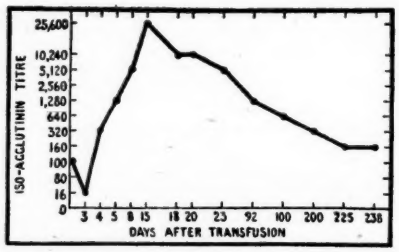

FIG. 1.—Transfusion of a group B recipient with group A blood. The curve shows the initial fall, rapid steep rise, and slow fall of the anti-A titre.

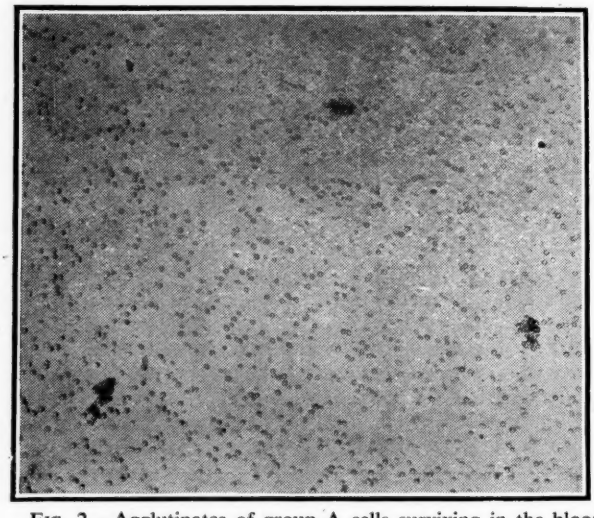

FIG. 2.—Agglutinates of group A cells surviving in the blood of the group B recipient on the third day after incompatible transfusion.

all titrations the same group A donor was used as standard. It was not possible to obtain blood regularly from the incompatible donor. No haemolysin was detected in the recipient's serum; this is in contrast to the observations of Jervell, Rö, and Mollison.

On the third day after the incompatible transfusion 2 c.cm. of the recipient's blood was mixed with 1 c.cm. of citrate solution and allowed to stand till sedimentation was complete. Using a red cell counting pipette, some red cell sediment was drawn up to the mark 0.5, and then citrate solution up to the 101 mark. After mixing, a

few drops were expelled on to a glass slide and examined with a microscope. Agglutinates consisting of 20 to 30 cells were seen lying free among large numbers of unagglutinated cells and were hardly affected by a strong anti-A serum. The red cell sediment, however, was solidly agglutinated by a strong anti-B serum. These observations were confirmed by Prof. J. B. Duguid, who kindly took the photomicrograph (Fig. 2). Four days after incompatible transfusion only a few small agglutinates were found among the recipient's cells, but none were found on the fifth day.

In an attempt to find an *in vitro* explanation for the absence of symptoms, the following investigations (Tests I to IV) were made about eight months after the incompatible transfusion (Nov. 18).

TEST I.—*The Incompatible Donor's Serum (anti-B) was Tested for Potency by Titration against the Cells of the Recipient and Cells of Random Group B Persons*

Serum	Cells of Group B Persons	Titre					
		2	4	8	16	32	64
Incompatible group A donor	Recipient ..	++	++	++	++	+	0
	3200	++	++	++	++	+	0
	11623	++	++	++	+	+	0
	11624	++	++	+	+	0	0
	11625	++	++	++	+	+	0
	11626	++	++	+	+	0	0
	11647	++	++	+	+	0	0
	11652	++	++	+	+	0	0

++ = Agglutinates visible to naked eye. + = Agglutinates visible only on microscopy. 0 = No agglutination.

TEST II.—*The Recipient's Serum, Diluted 1 : 10, was Tested for Potency by Titration against the Incompatible Donor's Cells and Cells of Random Group A Persons*

Serum	Cells of Group A Persons	Titre						
		20	40	80	160	320	640	1280
Recipient group B	Incompatible donor	++	++	++	+	?	0	0
	Standard donor ..	++	++	++	+	0	0	0
	11628	++	++	+	+	0	0	0
	11633	++	++	++	+	+	0	0
	11635	++	++	++	+	0	0	0
	11636	++	++	++	++	+	+	+
	11640	++	++	+	+	0	0	0
	11646	++	++	++	++	+	0	0
	11654	++	++	++	++	+	0	0

TEST III.—*The Incompatible Donor's Cells (Group A) were Tested for Sensitivity against Sera of Random Group B Persons*

Sera of Group B Persons	Cells	Titre								
		2	4	8	16	32	64	128	256	512
3200 ..	Incompatible group A donor	++	++	++	++	++	+	+	0	0
11623 ..		++	++	++	++	++	++	+	+	+
11624 ..		++	++	++	++	+	+	0	0	0
11625 ..		++	++	++	++	+	+	0	0	0
11626 ..		++	++	++	++	+	+	+	0	0
11647 ..		++	++	++	++	++	++	+	+	0
11652 ..		++	++	++	+	+	+	0	0	0

TEST IV.—*The Recipient's Cells (Group B) were Tested for Sensitivity against Sera of Random Group A Persons*

Sera of Group A Persons	Cells	Titre									
		2	4	8	16	32	64	128	256	512	1024
11628 ..	Recipient, group B	++	++	++	++	+	+	0	0	0	0
11633 ..		++	++	++	++	++	++	++	+	+	0
11635 ..		++	++	++	++	++	++	+	+	0	0
11636 ..		++	++	++	++	+	+	0	0	0	0
11640 ..		++	++	++	++	++	++	++	++	+	+
11646 ..		++	+	+	0	0	0	0	0	0	0
11654 ..		++	++	++	++	++	++	+	0	0	0
35896 ..		++	++	++	++	++	+	+	0	0	0

Whereas the donor's serum agglutinated the recipient's cells only to 32 (see Test I), yet random A sera agglutinated these cells on an average of 128 to 256, the range being 8 to 1024 (see Test IV). Elsdon-Dew (1936) found the anti-B titre of six A sera to be respectively 512, 16, 64, 32, 128, and 64. Aubert, Boorman, Dodd, and Loutit (1942) found that 22.4% of O sera had anti-B titres of 64, and 13.6% a titre of 256; if the dilution factor caused by adding the volume of red cells in the titrations be included, the figures become 128 and 512. Clearly the donor's anti-B titre was comparatively low. Aubert, Boorman, Dodd, and Loutit (1942) transfused conscious group A recipients with O sera of high anti-A titre and did not produce dangerous or fatal reactions. Very high titre sera did, however, cause some destruction of erythrocytes. It seems reasonable to assume that the low titre anti-B iso-agglutinin of the donor in no way harmed the recipient's cells, and absence of symptoms may in part be attributed to this. For instance, the haemoglobin did not fall, being 60% before and 66% the sixth day after incompatible transfusion. The recipient's anti-A iso-agglutinin was but little weaker than the average (compare Tests II and III). Elsdon-Dew (1936) found the anti-A titre of five B sera to be respectively 2048, 32, 256, 2048, and 64. Aubert, Boorman, Dodd, and Loutit (1942) found 26% of O sera had anti-A titres of 256, and 40% had titres of 512 or higher, though, as noted above, these figures do not include the dilution factor. The red cells of donor and recipient were of average sensitivity (see Tests III and IV). In contrast to the findings of Burnham and of Grove and Crum, absence of symptoms was not attributable to inability of the iso-agglutinins to function at 37° C.

As pointed out by Aubert, Boorman, and Dodd (1942), plasma or serum agglutinogen may function as an *in vivo* neutralizer of iso-agglutinins in transfused blood, plasma, or serum. However, Aubert, Boorman, Dodd, and Loutit (1942) observed that even if the recipient's plasma has considerable agglutinogen content, this will not completely protect the recipient's cells from transfused incompatible iso-agglutinins. To assess agglutinogen content of plasma and sera, and therefore their inhibiting power, Aubert, Boorman, and Dodd (1942) devised the "inhibition index" test. Briefly, A or B sera were titrated in saline and the end-point noted. The sera were then mixed in equal proportions and again titrated. Certain sera reduced or inhibited the titre of other sera—an observation also made by Elsdon-Dew (1936). Thus if a titre was reduced from 128 to 16 the inhibition index of the inhibiting serum was expressed as 8. It was indicated that the test was only an approximate guide to the amount of inhibiting substance present. The presence of group-specific substances A and B in solution partly explains reduced titres of pooled plasma or serum.

Seven months after the incompatible transfusion, when the anti-A titre had approximated the pre-transfusion level, the inhibition indices of the recipient's and donor's sera were investigated. It was 0 for each. The titration technique was that already described. The pooled sera were incubated for one hour at 37° C. In titrating the pooled sera the dilution caused by mixing the sera was taken into account and the titre of the first tube was reckoned as 4 instead of 2. There was thus no *in vitro* evidence that the recipient's plasma protected its erythrocytes from the donor's iso-agglutinins, and vice versa. Presumably the donor's iso-agglutinins were absorbed by the tissues of the recipient. Aubert, Boorman, and Dodd (1942) found no evidence that the agglutinogen substance in transfused serum neutralized the recipient's iso-agglutinins.

Conclusion

In vitro tests did not fully explain absence of symptoms, though the donor's cells were eliminated in five days. Absence of symptoms may be due to the fact that the incompatible blood was injected at a very slow drip rate. Mollison (1943) mentioned that reactions to incompatible transfusion seemed to be less severe than formerly, and that this might be due to the fact that transfusions are now commonly given at a drip rate. The danger of transfusing compatible blood rapidly into chronically anaemic recipients has been previously referred to by me (Drummond, 1943) and by others. If the blood is incompatible the effects are almost certain to be aggravated. It is possible that the favourable outcome in the case here reported is attributable to the very slow rate of injection of the incompatible blood.

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ANXIETY; ALOPECIA AREATA; NEUROFIBROMATOSIS: AURICULAR FIBRILLATION

DESCRIPTION OF A PATIENT

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The following account of a patient is published because he displayed three disorders whose aetiology and pathogenesis are unknown. His fourth disorder—a psychological state dependent on an unusual personality—appeared to us to stand in aetiological relationship to two of his three abnormal physical states.

Case Record

The patient, a house-painter aged 39, was referred to the Derbyshire Royal Infirmary on May 5, 1943, by Dr. Eileen Crowley for treatment of auricular fibrillation.

Personal History

His childhood was quite normal, healthy, and happy. He does not recall any fears or anxieties as a boy. He was the leader of a small group of boys who were rather "young devils." At the age of 12 he passed the necessary examination to enable him to leave school, and he went to work as a riveter's mate. By the time he was 14 he had held a variety of jobs and was earning £2 15s. a week (1918). He was restless and ambitious, and had come to realize how many limitations there were in the life of his childhood; he saw no reason why he should not go a long way. He began to serve an apprenticeship in the carriage-and-wagon works (Midland Railway), but could not tolerate the attempts of the older men to put him in his place. He had a row with one of them and walked out, thinking that he could easily get another job. The post-war difficulties had then begun and he was unable to get work. His pride was hurt, so he falsified his age and joined the Grenadier Guards at 15 years. His father got him out again, but only by paying a forfeit. He was still unable to get a job, and was burning with resentment. He rejoined the Army to get back the forfeit, and then malingered until he was discharged by the Medical Board. He felt better after this, and came back home seeking work.

Then began a long and difficult period of partial employment. In 1922, aged 18, he married a girl two years older than himself whom he had got pregnant. She already had one illegitimate child. He had to live on 34s. a week, so they had a room in the house of her brother-in-law. Soon he found that she had had the illegitimate child by this man, and he became furiously jealous. He thought and dreamed of nothing else for weeks, and made scenes by following the brother-in-law about the streets. His pride was desperately hurt, and it was some years before he ceased to worry about his wife's conduct. At this time (in 1926), aged 22, he developed two small patches of alopecia areata on his head.

He made fresh efforts to overcome his difficulties, working partly as a painter and partly as a pianist (he had taught himself to play the piano). Financial worries, however, continued to press on him, and on one occasion he was in prison for failure to pay a debt. Gradually his health deteriorated, his finances grew worse, and his alopecia recurred. Shortly afterwards he got a job at a hospital as a painter, and so had regular work for the first time for years (1932—aged 28). His worries were apparently over, for he had every chance of getting out of his financial difficulties.

Presently he found that a new skin affliction was developing in the shape of nodules beneath the skin of the back of his neck. He became preoccupied with his condition, and after seeing a propaganda film thought he had syphilis. He went to several doctors and had repeated Wassermann tests before he was satisfied about this, and, even so, the doubts have recurred at intervals since then. His hair continued to fall out. He became very ashamed of his appearance; he would try to dodge people, and thought that they were looking curiously at him. This only served to increase his determination to make good and to show his real worth.

After about seven years' work at the hospital he started a house-painting business, and with characteristic energy was soon doing well (1939). When the air raids began he found that there was not much work for him to do, so he joined the A.R.P. He realized that he would get extra money if he could drive a lorry; so he bought a car, learned to drive it in one or two evenings, and passed the necessary test. When the raids died down he was able to go back to his painting business, which continued to do well. He put a great deal of effort into every job he undertook, worrying greatly over the details of it. In April, 1942, one of his men stole a large sum of money from a firm for which he was doing a job. The man turned out to be a thief who had stolen from other clients of his, and the police had to make investigations all round the district where he worked. He was exceedingly distressed, and feared that no one would employ him any more. His heart began to beat irregularly and was shortly afterwards found by his doctor to be fibrillating.

Family History

The patient is either the sixth or the seventh of a family of twelve or thirteen children (doubtful about one older child who died). His mother was a fine woman who came from a healthy and highly respected family, and married rather beneath her. She was a great worker in good causes, was full of energy, and used to organize parades on behalf of the hospitals. She died of cardiac disease at 68 years. His father—a blacksmith—was a staunch teetotaller, and a good man. He suffered from rheumatism, and died of an unknown disorder when 65. The patient's paternal grandfather was blind during the latter part of his life and was extremely poor. Of the patient's brothers and sisters eight are still living. All have done very well. Three brothers are at present sergeants in the Middle East. He had no knowledge of any familial illness; nor does he know of any abnormalities of the skin or hair occurring in his parents or siblings.

His wife, aged 40, is in good health, but is a nervous woman. Of their three children, one daughter, aged 21, has a few small pigmented moles, but not café-au-lait patches or skin tumours. She bites her nails and has many night terrors. Otherwise her health is good. The other daughter, aged 18, has one small café-au-lait patch on the neck and many small pigmented moles, but no freckling or skin tumours. She has good health and a stable personality. The son, aged 14, has about 30 café-au-lait patches, the largest 5 in. by 4 in. on the back of the left thigh, diffuse freckling on the trunk, but no skin tumours. He has good health, and an impulsive, aggressive temperament, but his intelligence is poor. Under-development of sexual organs and a high palatal arch (speech defect) are other things of note.

Medical History and Habits

The patient's hair has been much in the condition described below for eleven years; it has grown slightly during the last two months. He now has to shave once a week, but for the preceding ten years had not shaved at all. The large tumour over the crest of the left ilium has been present as long as he can remember, but he does not think it was there in infancy. The other skin tumours appeared in 1933 and increased steadily in size and numbers until 1939; few if any new ones have developed in the last four years. Although he was aware of his cardiac irregularity at its onset in June, 1942, yet he is now for the most part unconscious of it.

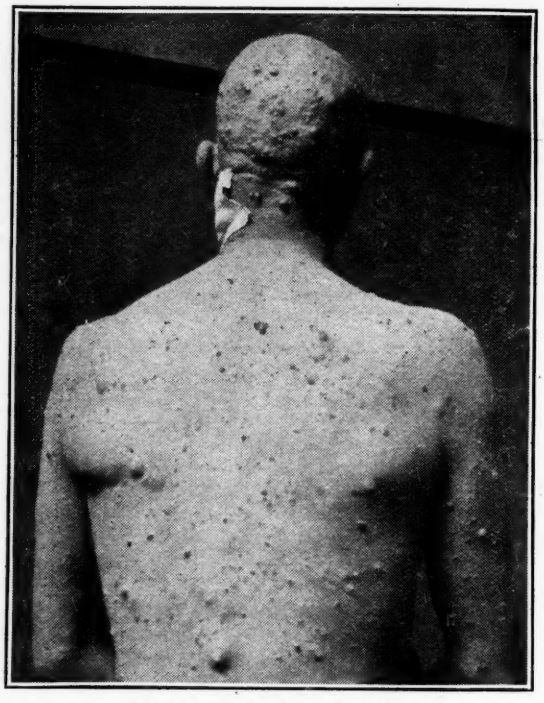

FIG. 1.—Back view of patient.

His habit for tobacco is 40 to 50 cigarettes a day and for alcohol 2 to 3 pints of beer a day. He has had no loss of libido at any

time. He is capable of great physical activity, and has had no other illness of importance in his life; no rheumatic fever or rheumatism. He well illustrated his impulsiveness by discharging himself from the hospital on the morrow of his admission and telephoning the following evening asking for readmission.

Examination showed him to be a healthy active man: height 5 ft. 10½ in., weight 11 st. 12 lb. *Hair:* Fine, sparse hair on scalp; no eyebrows; eyelashes very thin and poor; axillary hair very thin; no visible chest hair; pubic hair very thin and short. *Skin:* Diffuse freckling on the trunk and a few small café-au-lait patches on the abdomen and lower limbs. Nails are picked and bitten very short. There are no lesions on the mucous membranes. There is no detectable thickening of any nerves, nor are there any fibromata along their course.

Neurofibromata.—Hundreds of small skin tumours, varying in size from 1 mm. to 2 cm., are present on the face, scalp, neck, trunk, and limbs (Fig. 1). There is a larger one—a soft sessile tumour measuring 12 cm. across—just above the crest of the left ilium. These tumours occur with the greatest frequency on the scalp, face, neck, and trunk, but they are present in progressively diminishing numbers towards the periphery of the upper and lower limbs. The hands are practically free, and the feet have only one or two small nodules on the dorsum. Some of the tumours are under the skin, but the majority are on the surface of the skin as sessile tumours. They correspond well with the usual textbook descriptions of neurofibromata, which feel as if they were " herniated " through the fascia and can be " reduced " by pressure. The tumours are not painful.

Circulatory System.—The pulse is grossly irregular in force and frequency. The cardiac rate is 104 and the pulse rate 86; blood pressure 110/75. The retinal vessels are normal and there is no evidence of arteriosclerosis anywhere. There are no murmurs in the cardiac area, and the sounds are normal. The diagnosis of auricular fibrillation is confirmed by electrocardiogram (see Figs. 2 and 3), and radiographs show a heart shadow normal in size and shape.

The thyroid gland is not enlarged and there is no evidence of thyrotoxicosis: no tremor and no exophthalmos. There is no evidence of other endocrine disorder. Examination of the central nervous system revealed no abnormality, but he has very brisk muscle reflexes. The hands and feet are damp. The urine is normal. The blood sedimentation rate is 10 mm. in the first hour and 18 mm. in the second. His blood count shows: Hb, 103%; red cells, 5,480,000; white cells, 12,000, of which 2,440 are lymphocytes and 610 monocytes; the remaining 75% are neutrophils. His blood cholesterol is 115 mg. per 100 c.cm. of blood. His Wassermann reaction and

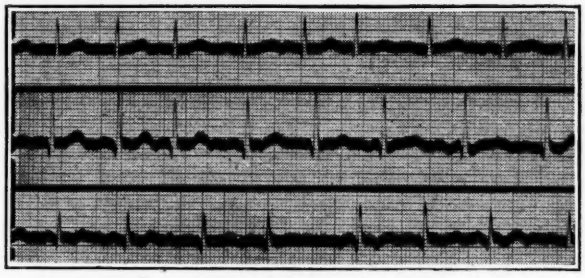

FIG. 2.—Electrocardiogram before quinidine therapy.

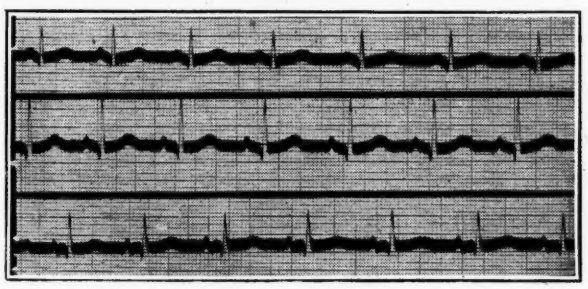

FIG. 3.—Electrocardiogram after 25 gr. of quinidine daily.

flocculation test are negative. A fractional test meal showed a histamine-fast achlorhydria in all specimens.

The report (Dr. G. R. Osborn) on the microscopical structure of a removed tumour from the back of the neck is: " The cutaneous nodule excised measures about 8 mm. in diameter. Microscopically this is a neurofibroma (fibroma molluscum). The most prominent nervous element is whorled groups of Schwann cells (schwannoma). Around these there is fibrous tissue with many small blood vessels. Nothing suggestive of malignancy seen. *Diagnosis:* neurofibroma."

Psychiatric Summary

Coming from a superior working-class background, possessed of great drive and ambition, impulsive and resentful of failure, this patient suffered great frustration and anxiety, at the peak of which he twice developed alopecia areata. The second attack of alopecia progressed in spite of the partial relief of anxiety, and at this time he developed the multiple subcutaneous nodules. A third severe period of anxiety ten years later coincided with the development of auricular fibrillation. He is a well-spoken and obviously intelligent man who has educated himself beyond the level he would have attained when he left school at 12. His whole attitude indicates the possession of quite exceptional drive and ambition, with a keen sense of pride in his own achievements and strong resentment against the social and economic difficulties which have held him back and the disease which has disfigured him. His impulsiveness is well shown by his history. He is inclined to brood over his difficulties; his anxiety and desire for success reach an obsessional pitch at times. Some of his worries have definitely shown an obsessional character.

Diagnosis; Progress

The case was diagnosed as one of anxiety, alopecia areata, neurofibromatosis, and auricular fibrillation.

Quinidine therapy was started soon after admission, and when the dose had reached 25 gr. a day the patient's cardiac rhythm switched to normal (Figs. 2 and 3). He was discharged on July 9, 1943, on a maintenance dose of 5 gr. of quinidine twice daily, which has been continued till now except for one month when, unknown to him, aspirin was substituted for his quinidine. He had no further fibrillation until Dec., 1943, when his cardiac rhythm became irregular again, after an attack of influenza. His heart was quickly converted to a normal rhythm with 20 gr. of quinidine in the day.

Comment

Von Recklinghausen's disease is characterized by neurofibromata and by abnormal pigmentation, as described in this man. These café-au-lait patches and diffuse frecklings are regarded as *formes frustes* of the disease (Parkes Weber, 1909) when they appear in the relations of those suffering from its fully developed forms. The disease is now thought to be inherited as a Mendelian dominant. More interesting than the disease itself are the abnormalities which are often associated with it. These are of great variety, and include mental, endocrine, autonomic, and skeletal disorders; they have been reviewed in a paper by Levin and Behrman (1940). Although defective development of pubic hair is mentioned in that review, there is no report, either in this or in other papers, of an associated alopecia areata. Auricular fibrillation has once before been described (Clarke and Wakefield, 1926) in association with neurofibromatosis, and these authors attribute it to an involvement of the vagus nerve by the tumours. No necropsy was obtained on their patient, but, according to them, the vagus nerve is the commonest of the cranial nerves to be involved by neurofibromata. It is difficult to believe that the auricular fibrillation in our patient could have been due to implication of any part of the autonomic system by the tumours, since quinidine has returned his heart's rhythm to normal, and the rhythm has remained regular even when the quinidine has been stopped. It is simpler to postulate that the auricular fibrillation and the alopecia areata are related to the neurofibromatosis in the same way as are the vast array of associated disorders already described in the literature—and that is, at a genetic level.

Levin and Behrman quote the views of Pende (supported by " many learned arguments "), who in 1910 suggested that neurofibromatosis has a place in a large group of endocrine-sympathetic dystrophies, among which he also included scleroderma and painful lipomatosis. For the production of these conditions two factors are required:

(1) A *constitutional factor*, represented by an abnormality of the endocrine–sympathetic system, which may be hereditary, intra-uterine, or extra-uterine during the period of growth; and

(2) A *precipating factor*, such as shock, trauma, toxins, or infection, which through its effects on the endocrine–sympathetic system acts as a stimulus to embryonal elements of the autonomic system in the skin.

This appears to us as satisfactory an explanation of the aetiology of neurofibromatosis as can at present be attempted, and it can be similarly applied to alopecia areata and to idiopathic auricular fibrillation. Alopecia areata has been related to emotional disturbances by numerous observers. This association has been denied with equal frequency. In our

experience of alopecia areata it has not been difficult, in both children and adults, to demonstrate a preceding emotional stress. Auricular fibrillation is associated with mitral stenosis, with thyrotoxicosis, and with myocardial degeneration. None of these conditions was present in our patient. Distinct from these varieties is another group called "paroxysmal auricular fibrillation." It is characteristic of these paroxysms that they last only a few hours or days, that they recur frequently, and that they are corrected to a normal rhythm with ease and safety by quinidine therapy. It is difficult to define as paroxysmal a condition which has persisted for eighteen months, as in our patient. When auricular fibrillation is unassociated with any organic disease and when it is preceded by adequate emotional tension, as in this man, it is reasonable to name it a cardiac neurosis.

This man's illness illustrates the varied factors—genetic, constitutional, psychological, environmental, and mechanistic—which we seek to assess in an evaluation of disease in man, but it also indicates how remote is the day of full comprehension. The link between the emotion which fails to find its appropriate physical discharge and the consequent physical disorder is usually assumed to be the vegetative nervous system; while this path is probable, the endocrine system offers an alternative mechanism. Both alopecia and auricular fibrillation are sometimes associated with endocrine disorder. We are far from a coherent conception of the mechanism by which emotional stress is translated into physical disorder. Not to seek this link, however, or, worse, to ignore its existence, is a heretical denial of the integrity of mind and body.

The present controversy between those who support the "biological" approach to aetiology ("What sort of man is this, and why did he become ill in the way he did?") and those who are preoccupied with mechanism ("What has the patient got?") implies a schism in diagnosis and therapy which is quite unreal. In our patient it was possible to define closely but one of the faulty mechanisms involved (i.e., auricular fibrillation), and here it was easy to intervene to the man's great advantage. While the biological approach to aetiology had in this case none of this immediate practical quality, yet it contributed to a fuller understanding of the sufferer and his disorder. The physician cannot disdain any approach which increases either his understanding or his capacity to help his patient.

We are grateful to Dr. J. T. Ingram, dermatologist to the General Infirmary at Leeds, for his expert help and criticism in the preparation of this paper, and to Dr. G. R. Osborn, pathologist to the Derbyshire Royal Infirmary, for the photograph and the report on the sections of the tumour.

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A MILK-BORNE OUTBREAK OF GASTRO-ENTERITIS DUE TO SALMONELLA DUBLIN

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On Aug. 19, 1943, the County Medical Officer of the West Riding of Yorkshire was informed that the practitioners in Knaresborough Urban District had throughout that day been called in to attend to numerous cases of sickness and diarrhoea. Inquiry by the local medical officer of health showed that all the cases had occurred in households supplied with milk from Farm G, situated at a village about two miles distant in an adjoining rural district. Simultaneously cases had occurred among residents at the farm. It therefore seemed that the disease was conveyed by the milk distributed from Farm G. Subsequent investigation proved that the outbreak was caused by *Salmonella dublin*, that the vehicle of infection was milk from Farm G, and that the source of infection was an apparently healthy cow which was a carrier of the organism.

Symptoms

The onset of the disease was sudden, with sickness or actual vomiting, diarrhoea, headache, and fever ranging from 100° to 102° F. The diarrhoea was profuse, but there was no blood or mucus in the motions. The febrile period lasted for about three days at the longest. A profuse herpetic eruption on the lips and nose was noted in a small proportion of cases. One patient complained of persistent headache for some days during convalescence. Many cases were very mild, and some patients were not confined to bed or were confined to bed only for a day. There were no deaths.

On Aug. 29 a baby 2 months old died of meningitis, but unfortunately no bacteriological or post-mortem examination was made. This child, which was breast-fed, did not suffer from diarrhoea. It was a member of a household of five persons supplied with milk from Farm G. One member of the household (not the mother) had been ill with diarrhoea about Aug. 19. This case is noted because Smith (1934) has described two sporadic cases of meningitis in children due to *S. dublin*.

Incubation Period

Cases occurred among the residents at a hostel for evacuee children, from particulars of which the duration of the incubation period was determined. The circumstances also confirmed the fact that the outbreak was milk-borne. At the hostel there were 7 children and a staff consisting of a matron, a nurse, and a cook. A daily charwoman was also employed. At the time of the outbreak a friend of the nurse was staying there. The hostel was supplied with milk from Farm G, and the residents, with the exception of the matron and cook, had milk at about 11 a.m. on Aug. 18. The charwoman also had milk on that day. About 2 a.m. on the 19th three of the children complained of sickness and diarrhoea, and by 8 a.m. all the children, the nurse, and her friend were ill. The charwoman, on arriving at the hostel that morning, complained that she had suffered from sickness and diarrhoea during the night. The matron and cook, who did not take milk, remained well.

The interval of time between the consumption of milk and the onset of symptoms varied from 14 to 20 hours. This relatively long incubation period suggested infection with living Salmonella organisms.

Outbreak in the Urban District

As the practitioners were requested to notify cases of sickness and diarrhoea it was possible to estimate approximately the magnitude of the outbreak. The total number of cases notified was 162, and 79 households were involved. Some of the known cases were very mild, and it is therefore probable that there were many more cases, which did not come to light as a doctor was not called in. The date of onset of the illness was stated to be Aug. 18 in 2 cases, Aug. 19 in 143 cases, and Aug. 20 in 15 cases; in 2 cases the date was not given. The age and sex incidence is shown in Table I.

TABLE I.—*Age and Sex Incidence of Cases of Gastro-enteritis notified in the Knaresborough Urban District*

Age	Cases	Females	Males
Under 5	35	21	14
5– 9	23	12	11
10–14	16	4	12
15–24	24	19	5
25–34	23	21	2
35–44	15	10	5
45 and over	26	17	9
Totals	162	104	58

Outbreak at Farm G

On making investigations at the farm it was found that six persons were resident there: the farmer H. F., aged 70; his son-in-law T. P., aged 36; his three daughters, R. P., aged 36, J. B., aged 32, and W. F., aged 23; and his granddaughter, J. P., aged 9. Two farm labourers—H. R., aged 40, and C. K., aged 35—were employed, but lived with their families in the village and were supplied with milk from the farm. The farmer, his son-in-law, and his granddaughter were ill with sickness and diarrhoea. The other residents and the two labourers were well, and remained well. All the members of

the labourers' families, seven in number, were ill. Other cases were known to have occurred in the village among persons supplied with milk from the farm. Particulars of the cases connected with the farm are given in Table II.

TABLE II.—*Particulars of Patients Resident at or Associated with the Farm*

No.	Name	Sex	Age	Relation	Condition	Onset of Illness	Bacteriological Examination
1	H. F.	M	70	Farmer*	Ill	18/8, 9 p.m.	Positive
2	T. P.	M	36	Son-in-law*	,,	19/8, a.m.	,,
3	R. P.	F	36	Daughter†	Well	—	Negative
4	J. B.	F	32	,,	,,	—	,,
5	W. F.	F	23	,, †	,,	—	,,
6	J. P.	F	9	Granddaughter	Ill	19/8, 4 a.m.	Positive
7	H. R.	M	40	Labourer*	Well	—	Negative
8	E. R.	F	44	Wife	Ill	18/8, p.m.	Positive
9	W. R.	F	19	Daughter	,,	18/8, p.m.	Negative
10	H. R.	M	10	Son	,,	18/8, p.m.	,,
11	C. K.	M	35	Labourer	Well	—	,,
12	E. K.	F	26	Wife	Ill	18/8, p.m.	Positive
13	J. K.	F	10	Daughter	,,	18/8, p.m.	,,
14	B. K.	F	7	,,	,,	18/8, p.m.	,,
15	C. K.	M	2	Son	,,	18/8, p.m.	,,

Nos. 1 to 6 were resident at the farm; Nos. 7 to 15 were resident in the village.
* Milker. † Milk distributor.

Production and Distribution of the Milk

At the farm there were 20 cows, two of which were dry. The cows were milked by the farmer, his son-in-law, and the labourer H. R. When the farmer and his son-in-law became ill the milking was continued by H. R., assisted by the other labourer, C. K. Milking was done by hand. The milk, of which about 36 gallons were produced daily, was distributed by the farmer's daughters R. P. and W. F. to about 600 registered customers in the urban district and 12 in the rural district, the number of households supplied being about 200. There was only one calf on the farm, and neither the calf nor any of the cows showed evidence or gave a history of enteritis. None of the cows had been recently added to the herd. There were no pigs at the farm and there had been no disease among the poultry.

Procedures taken to Prevent the Spread of Infection

When the farm was visited on the morning of Aug. 20 the evidence strongly pointed to the milk as the vehicle of infection, and the first problem which arose and required immediate decision was what steps should be taken with regard to the milk to preclude the possibility of the occurrence of further cases. At that time there was no bacteriological proof that the milk was infected. The results of bacteriological examinations, which had been started very late on the previous evening, had proceeded only far enough to indicate that a pathogenic organism was present in the faeces of some of the cases.

Two courses were open—namely, to prohibit the use of the milk for human consumption or to allow it to be used only after pasteurization and to be distributed only by persons unconnected with the farm. The former procedure would, if adopted, have involved the waste of a considerable amount of milk, which is a valuable and at the present time not too abundant food, besides causing financial loss to the farmer. In view of these considerations it was decided to allow the milk to be used after pasteurization.

On the afternoon of the same day arrangements were made with the local officer of the Ministry of Food and with the Milk Marketing Board to collect the milk at the farm, take it direct to a pasteurizing plant, and distribute it from there after pasteurization. By this arrangement the milk did not return to the farm. A supply was provided for the farmer's customers, and this was distributed by another retailer. The last delivery of milk direct from the farm was on the morning of Aug. 20. It was also arranged to examine the milk produced at the farm and specimens of faeces and urine of all persons resident at or connected with the farm. Those who had the disease were prohibited from taking part in the milking until declared free from infection, and the milkers were warned to exercise care in the cleansing of their hands and the dairy utensils.

A request was made to the Ministry of Agriculture to have the herd examined by one of its officers. An examination was made on Aug. 23, and the veterinary officer reported that "several of the cows were found to be affected with cowpox, in some cases very severely, and the teats in these cases were a mass of sores, some of them being wet and running." The farmer was advised as to treatment of the condition, and was requested to call in his own veterinary surgeon to continue the treatment; to this he agreed. When it was subsequently found that a cow was excreting the organism in the dung, this animal was excluded from the herd and instructions were given not to allow its milk to be mixed with that taken to the pasteurizing plant or to be used for human consumption or fed to animals unless it had previously been boiled.

Bacteriological Examination

On Aug. 19 specimens of faeces from 8 patients in the urban district and a specimen of milk collected at the hostel were received for examination. Of these, 7 specimens of faeces and the specimen of milk were found to contain an organism of the Salmonella group. The milk was very heavily infected. Two loopfuls spread on a MacConkey plate showed after 24 hours' incubation more non-lactose-fermenting colonies than colonies of coliform organisms. The pathogenic organism was motile and fermented glucose, mannitol, and dulcitol with formation of acid and gas, but gas was at first not abundant. It did not ferment lactose or saccharose; it formed hydrogen sulphide but no indole. It was strongly agglutinated by polyvalent Salmonella serum.

The serological identification of the organism proved difficult. It was equally well agglutinated on the slide by *typhosum* O serum and by *aertrycke* O serum. This was probably due to the presence of an overlapping O antigen XII (Topley and Wilson, 1936). Agglutination to titre carried out in tubes showed a slightly higher titre with *typhosum* O serum. A weak but definite reaction with *Gaertner* H serum indicated that the organism probably belonged to the enteritidis subgroup. As the organism could not be placed nearer with the sera available, cultures isolated from one of the patients and from the milk were sent to Dr. Joan Taylor, of the Salmonella Reference Laboratory, Oxford, who identified them as *Salmonella dublin*.

The examination of the specimen of milk which was collected at the hostel was of interest as it showed not only that the milk was the vehicle of infection but also that it must have been infected on at least two occasions. The specimen was a sample of milk delivered at the hostel on the morning of Aug. 19. At that time all the children, the nurse, and her friend were ill and did not take any of that milk. The milk had not been handled by any of the inmates except the matron and cook, who had not been ill, and therefore it is very unlikely that it could have become infected after delivery at the hostel.

Specimens of faeces and urine from all the residents at the farm and from the two farm labourers and the members of their families were also examined. The organism was shown to be present in the faeces or urine of all the residents at the farm who had been ill, and of five of the seven members of the labourers' families who had been ill. It was found nine times in specimens of faeces and three times in specimens of urine. Cultures made from the material collected from the lesions of the cows suffering from cowpox showed only coagulase-positive golden staphylococci. Repeated examination of samples of bulked milk collected at the farm, of the water supply of the farm, and of water in a stagnant pond on the farm all gave negative results. Repeated examinations of the dung of the calf were also negative.

It is known that infections due to *S. dublin* are especially associated with calves and cattle (Savage, 1940). Conybeare and Thornton (1938) isolated *S. dublin* from the dung of an apparently healthy cow which was shown to have a high serum-agglutinin titre for that organism. In the present outbreak it was impracticable, owing to transport and other difficulties, to collect specimens of dung and blood of all members of the herd. It was possible, however, to obtain samples of milk from individual cows, and these were examined culturally and serologically. The cultures were negative in every case, but evidence of infection was obtained by investigating the agglutinin content of the milk. The individual samples of milk were mixed with rennet and the mixture was allowed

to stand on the bench until the whey had separated. Twofold dilutions of whey were prepared with 0.85% sodium chloride solution in a volume of 0.5 ml., the dilutions ranging from 1 in 2 to 1 in 256. Saline controls and normal milk controls were also set up at the time of the experiment. To all the tubes 0.5 ml. of a suspension of *S. dublin* was added. The opacity of this suspension was adjusted with normal saline solution until it was approximately the same as that of a standard suspension. The suspension was preserved by the addition of 0.4% of chloroform. All the tubes were incubated at 50° C. for two hours and allowed to stand on the bench overnight. The milk of Cow No. 10 was found to contain agglutinins for *S. dublin*, the titre being 1 in 32. The test was repeated with another specimen of milk of Cow No. 10, and a titre of 1 in 64 was obtained. The agglutination was of the flaky H type. The whey obtained from the milk of all the other cows did not agglutinate *S. dublin* in a dilution of 1 in 4. Subsequent examination of the dung of Cow No. 10 showed the presence of *S. dublin*. Two samples of dung were examined; in both an almost pure culture of *S. dublin* was obtained on direct plating on Leifson's medium, and many colonies were also detected on MacConkey medium. The identity of the organism was confirmed by Dr. Joan Taylor.

Discussion

Three extensive outbreaks of milk-borne gastro-enteritis due to *S. dublin* have been reported in this country. In the first two outbreaks, which occurred in Dundee in 1926 and 1927 and were reported by Tulloch (1939), the infection was traced to a cow that was ill. In the Wilton outbreak (Conybeare and Thornton, 1938) and in the present one, however, the absence of evidence of illness among the cows presented the problem of finding the animal carrier. Conybeare and Thornton discovered the carrier by examining the antibody content of blood samples of individual cows. They found that about 50% of sera gave an agglutinin titre of 1 in 25. The sera of three cows gave a titre of 1 in 400 or higher, and the dung obtained from one of these cows yielded *S. dublin* on cultivation.

In the present outbreak the search for the carrier was made by determining the agglutinin content of the milk. It was found that milk from healthy cows did not contain any agglutinins for *S. dublin* and that even a low titre of agglutinins in milk was indicative of infection. It appears, therefore, that milk is a suitable material for serological tracing of carriers of *S. dublin* not only because it is more easily obtained than blood but also because non-specific agglutinins for *S. dublin* are not usually present.

How the milk became the vehicle of infection is a matter of conjecture. As the dung of the carrier cow contained the organism in large numbers it seems probable that the milk became contaminated as a result of faulty methods of production at the farm. On the other hand, although the milk of this cow was repeatedly examined with negative results, the possibility of intermittent excretion of *S. dublin* in the milk cannot be excluded.

Summary

An outbreak of milk-borne gastro-enteritis due to *Salmonella dublin* is described. At least 162 people were affected. There were no deaths. The source of infection was an apparently healthy cow which was excreting large numbers of the organism in the dung. The carrier cow was identified by the agglutinin content of its milk. The milk of normal cows did not possess any agglutinins for *S. dublin*.

We are indebted to Dr. T. N. V. Potts, the County Medical Officer, and to Drs. D. F. Dobson and J. W. Forbes of Knaresborough for permission to publish an account of the outbreak. We thank the Divisional Inspector of the Ministry of Agriculture, Mr. W. T. MacGregor, and his assistant, Mr. J. M. McKellar; the County Sanitary Inspector, Mr. A. Brook; the local Sanitary Inspectors, Mr. H. Eatough and Mr. A. E. W. Lupton, for co-operation and assistance in the investigation; and also Mr. S. J. Denyer, Chief Technician at the County Laboratory, for technical assistance.

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THE EARLY TREATMENT OF WOUNDS OF THE CHEST IN THE MIDDLE EAST

BY

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The provision by the Army Medical Services of special teams for the treatment of wounds of the chest demands an explanation, if not an apology, from the general physician who has the temerity to express his opinions on this subject. During the first and second battles of El Alamein, in July and Oct., 1942, a number of battle casualties with wounds of the chest were admitted to a general hospital, at that time less than a hundred miles behind the line. This hospital played the part of a casualty clearing station, although retaining greater facilities for investigation and treatment, and the management of these cases fell to my lot as medical specialist. Thus this paper records the experience of a general physician in the immediate treatment of thoracic casualties without the expert assistance of a thoracic surgeon. The problems were those commonly confronting the medical specialist in a casualty clearing station, and they differed from the problems of the thoracic team in the more leisured atmosphere of the base hospital. Time was limited; only treatment urgently indicated could be undertaken; and the immediate aim was to ensure that the patient had recovered sufficiently to withstand the rigours of evacuation to the chest centre.

The Material

The material which forms the basis for these observations consists of 127 consecutive battle casualties with penetrating wounds of the chest. From the first battle wounded were admitted unselected, but from the second the hospital received only those whose condition was too precarious to allow of immediate evacuation. As this type of casualty is often gravely ill, chest wounds formed 13% of the second group and only 4.6% of the first. The majority had passed through a surgical unit, but treatment had commonly been confined to dressing and the administration of morphine. 46% were admitted within 48 hours and 72% within 72 hours of wounding. In all cases radiographs were taken, and it was possible to hold patients in hospital for as long as ten days when necessary; in these respects conditions differed from those usually operative in a casualty clearing station. No "follow-up" was practicable, but, through the courtesy of Major A. Logan, R.A.M.C., O.C. No. 1 Surgical Team for Chest Surgery, the ultimate fate of the majority is known.

An analysis of the arms of the Service from which these casualties were drawn shows, as would be expected, that the infantry suffered most heavily. The composition of the series was: infantry, 72.5%; artillery, 13.4%; R.A.C., 3.9%; R.E., 3.9%; R.A.S.C., 3.9%; R.A.O.C., 1.6%; R.C.O.S., 0.8%. The nature of the missile in the 63 cases in which it was known is set out in Table I.

TABLE I.—*The Nature of Missile in 63 Cases of Penetrating Wounds of the Chest*

Nature of Missile	No. of Cases
Shell fragment	34 (54·0%)
Bullet (rifle, m.g., or revolver)	17 (27·0%)
Mortar-bomb fragment	6 (9·5%)
Land-mine fragment	3 (4·7%)
Aerial-bomb fragment	1 (1·6%)
Hand-grenade fragment	1 (1·6%)
Unexploded 50-mm. A.P. shell	1 (1·6%)

TABLE II.—*The Intrathoracic Condition, on Admission to Hospital, of 127 Cases of Penetrating Wounds of the Chest*

Intrathoracic Condition	No. of Cases	No. Fatal
Haemothorax and haemopneumothorax	88 (69·4%)	5
Pneumothorax	5 (3·9%)	—
Pulmonary haematoma	14 (11·0%)	—
Atelectasis	5 (3·9%)	—
Lung abscess	2 (1·6%)	1
Thoraco-abdominal injuries	13 (10·2%)	6

The patient with a penetrating wound of the chest presents two problems: the parietal breach of surface, and the visceral commotion caused by the missile. In this paper the second problem is considered first. The intrathoracic consequences of these wounds are summarized in Table II, and are discussed more fully in the following paragraphs.

Haemothorax and Haemopneumothorax

The common sequel of a penetrating wound of the thorax is effusion of blood into the pleural cavity. The blood is usually derived from the damaged lung, and in only one of these cases was there evidence of haemorrhage from the parietes. The injury to the lung is followed by the formation of a pulmonary haematoma; probably bleeding is seldom of long duration and is checked by pulmonary collapse unless it be due to rupture of a large vessel. The presence of blood in the pleural cavity provokes a serous reaction of varying magnitude; the degree as well as the variability of this process is shown by the haemoglobin content and erythrocyte counts of haemothorax fluids in Table III.

TABLE III.—*Haemoglobin Content and Erythrocyte Count of Haemothorax Fluid from 9 Cases aspirated on Various Days after Wounding*

Day after Wounding	Haemoglobin %	Erythrocytes (millions/c.mm.)
0	110	—
4	27	1·04
5	32	1·15
6	20	—
6	70	3·20
9	60	3·17
10	19	0·94
10	25	1·04
12	70	—

With the blood, in many cases, air will enter the pleural cavity, although absorption must commonly be rapid, for in this series only 14 showed the radiographic features of haemopneumothorax on admission to hospital. This air may enter the pleural space through either the parietal or the visceral wound; and of these 88 cases, the wounds of 32 were noted to be "sucking" shortly after infliction. Continued escape of air from a wound of the lung was rare, and only one showed, in addition to a haemothorax, the features of a tension pneumothorax.

At this early stage infection was the only serious complication. It occurred in nine of these 88 cases, and in each instance was established within seven days of wounding; in all but one an infected fluid was found at the first aspiration; in each case *Str. haemolyticus* was the responsible organism. So far as could be determined none became infected after evacuation. It is worthy of remark that the haemothorax became infected in eight of the 32 cases with "sucking" wounds and in only one of the remaining 56. In this latter case infection appeared after the first aspiration; later this patient died, and post-mortem examination showed two splintered ribs with bony fragments driven into the lung, and around these fragments a suppurating pulmonary haematoma. In this series a persistent pleurocutaneous communication was the most important single factor in determining infection. The only other significant complication was the presence, in one case, of mediastinal emphysema producing cervical venous engorgement but no symptoms.

The ideal of treatment in traumatic haemothorax is to empty the pleural cavity. The circumstances in which these patients were treated made it possible only to aspirate those who showed a mechanical indication or features suggestive of infection. Where there was no dyspnoea, fever, or tachycardia, and where the clinical and radiographic evidence pointed only to a small effusion, the patient was transferred to the special chest unit after four or five days. Aspiration was performed in 58 cases, and in many of these on several occasions. Air replacement was done only when indicated by symptoms arising during the procedure or to facilitate adequate aspiration. There was no suggestion that fresh haemorrhage was promoted by removal of large quantities of fluid within a day or two of wounding: this danger appears hypothetical. In one case 3,870 c.cm. was withdrawn without replacement by air and with no results other than beneficial. Although aspiration is usually a simple procedure, in a number of cases the fluid becomes loculated, and radiographs show multiple fluid levels; in such it was often necessary to aspirate each loculus separately after location by radiograph. With infected haemothorax repeated aspiration was undertaken in the hope that the patient would improve enough to permit his transfer; but in five cases closed drainage by intercostal catheter was necessary.

In addition to aspiration in as many cases as circumstances allowed, all patients received 4 g. of sulphanilamide daily for six days and, when anaemia indicated, blood transfusion. It was possible to keep most cases in hospital for a week and to evacuate them only when temperature and pulse frequency had been normal for three or four days, and when orthopnoea had disappeared.

Of these 88 cases of haemothorax five were fatal before evacuation; so far as could be determined none died subsequently. The post-mortem findings in these fatal cases are given in Table IV.

TABLE IV.—*Post-mortem Findings in 5 Fatal Cases of Haemothorax*

Case	Day of Death after: Wounding	Day of Death after: Admission	Post-mortem Findings	Operation
1	3	1	Haemothoraces, bilateral, uninfected; perf. of bladder and small bowel	Laparotomy; repair
2	7	3	Haemothorax, right, infected; mediastinal empyema; left eye excised	Aspiration; excision left eye
3	13	6	Haemothorax, right, infected; streptococcal stomatitis	Aspiration; intercostal drainage
4	7	2	Haemothorax, right, infected; fracture 2nd and 3rd ribs, right; abscess right upper lobe	Aspiration
5	11	5	Haemothorax, left, infected; fracture sternum and 2nd rib, left; osteomyelitis of sternum	Aspiration

Pneumothorax

Five cases presented the clinical and radiographic features of pneumothorax without effusion of blood into the pleural space. Of these, only one resulted from a "sucking" wound; the remainder were due to small fragments of hand-grenade or mortar bomb. In one case the wound of entry was in the neck, and the missile had traversed the mediastinum to rest in the right lung; in this instance mediastinal emphysema was associated with the pneumothorax. In only one was it necessary to withdraw air from the pleural cavity, and this procedure did not require repetition. The other patients did not need special treatment.

Pulmonary Haematoma

On *x*-ray examination 14 cases showed circumscribed shadows in the lung fields without evidence of pleural effusion. These opacities were roughly circular, and varied in diameter from 5 to 12 cm.; in the centre of two a metallic foreign body was visible. A pleural friction rub was heard in three cases seen shortly after wounding. Subsequent radiographs showed decrease in size and density of the shadow, and the appearances were interpreted as due to pulmonary haematomata. Two cases with large opacities showed later a transient jaundice without choluria, which was taken to indicate absorption of the effused blood. In one there was also a small pneumothorax with mediastinal emphysema. The distinction between pulmonary haematoma and haemothorax is difficult without radiography.

At the stage under consideration no treatment was required for the intrathoracic lesion. A sequel which had been met with in previous cases was the late development of a serous pleural effusion; it was noted in none of the present group while under my observation.

Lung Abscess

There were 2 examples of lung abscess in this series. It is likely that, in both, infected haematoma of the lung would describe the lesion more precisely; each was characterized by a fistulous communication between an infected parietal wound and the abscess cavity. Both patients had received extensive surgical toilet of the wound with suture in a forward unit; in one the lung had been secured to the chest wall. After admission to hospital, removal of sutures from the superficial wound led to improvement sufficient to permit evacuation. One patient died a month later.

Atelectasis

It was a common experience to be called to see men with wounds of the chest, often associated with fracture of ribs or scapula, in whom urgent dyspnoea had convinced the medical officer that the pleura had been penetrated. In many no penetrating wound was found, but pain had led to shallow tachypnoea with voluntary suppression of cough; bronchial secretions had accumulated and rhonchi were audible throughout both lungs. In these cases local measures to relieve pain—of which the most important was removal of skin sutures—a dose of morphine, and persuasion to cough resulted in rapid emptying of the respiratory passages and the disappearance of distress. Untreated, atelectasis with subsequent infection was almost inevitable. In 5 cases with penetrating wounds the radiological findings were limited to those of collapse of one or other lower lobe. It was common, even with extensive intrathoracic damage, to find a high diaphragmatic shadow, and it seems likely that atelectasis from bronchial obstruction by aspirated blood or secretion is often a sequel of thoracic wounds. In three cases with haemothorax there was radiographic evidence of collapse of the contralateral lower lobe. Treatment of these five cases was confined to attempts to moderate the pain and to promote drainage by posture; infection was discouraged with sulphapyridine. In all five cases uneventful re-aeration was achieved.

This clinical picture is familiar in patients with simple fracture of a rib; its greater frequency and importance in those with wounds of the chest must serve for excuse if the point appears laboured. The chances of its occurrence can be minimized by relief of pain, and this should be achieved by local measures so far as is possible: a tightly sutured wound of the chest is often agonizing. Limitation of thoracic movement by exuberant strapping and prolonged inhibition of the cough reflex with morphine are undoubtedly important factors in its production.

Thoraco-abdominal Injuries

In 13 cases the missile had traversed both the thoracic and the abdominal cavities; six of these patients died. Details are not pertinent; but, where the entry wound was left-sided, intestinal perforation and, consequently, death was frequent. Hernia through the diaphragmatic wound was seen twice; in three a missile lodged in the upper part of the right lobe of the liver had provoked a sero-sanguineous subphrenic effusion.

The present relevance of this group of cases lies in the diagnostic difficulty they offer. This difficulty is increased by the frequent association of simple penetrating wounds of the thorax with abdominal pain, rigidity, and tenderness—symptoms which in four cases of uncomplicated haemothorax led to fruitless laparotomy. Survival depends on early exploration, and when the entry wound is in the lower third of the chest suspicions of abdominal as well as of thoracic injuries should be aroused.

Treatment of the Parietal Wound

The observations of a physician on this technical aspect of surgery will be regarded probably as worthless and certainly as impertinent. Thus it is with trepidation that these comments are offered, and because of the effect of the initial treatment of the parietal wound on the patient's subsequent course.

At this time there was little uniformity in the practice of surgeons in the forward areas, and Table V sets out the treatment

TABLE V.—*Initial Treatment of Parietal Wounds in 127 Penetrating Injuries of the Chest*

Dressing	No. of Cases
Simple dressing	80 (62·9%)
Strapping over vaselined-gauze pack	9 (7·1%)
Excision and strapping over vaselined-gauze pack	8 (6·3%)
Suture without excision	11 (8·6%)
Excision and suture	10 (7·8%)
Excision and suture over vaselined-gauze pack	4 (3·2%)
Exploration, excision, and suture	5 (3·9%)

applied to the wounds in the present series before admission to hospital. Suture, with or without excision, was almost invariably followed by infection of the chest wall; it always led to a painful wound and the possibilities discussed under the heading of atelectasis. The practice latterly was to remove skin sutures immediately the patient was admitted to hospital. In three instances a sutured wound broke down to leave a pleurocutaneous fistula; this was particularly likely to happen when the edges of the wound were approximated under tension and the intrapleural pressure was raised by a large haemothorax. Two of five cases in which the wounds were explored and sutured subsequently developed infection of the lung.

From experience with this group of cases it was concluded that the immediate treatment of the parietal wound should be as conservative as possible. The indications are to control haemorrhage from the chest wall and to close an open pneumothorax. If there is no serious haemorrhage and the wound is not "sucking," simple dressing is adequate; if the wound is "sucking" it should be closed by strapping over an air-tight pad and the intrapleural pressure lowered by aspiration of the haemothorax. The strapping should not hamper breathing by encompassing the whole chest.

In three cases which reached hospital with an infected haemothorax and a parietal wound that had broken down, immediate closed drainage through a catheter inserted at a distance from the wound was the only way the open pneumothorax could be controlled.

Immediate exploration should be limited to cases in which haemorrhage demands it, and perhaps to those in which fragments of bone have been driven into the lung; for this type of injury is likely to be followed by pulmonary suppuration. Uncritical exploration carries the additional danger of converting a closed haemothorax into an open haemopneumothorax—an event which invites the entry of infection.

Summary

The management of 127 cases with penetrating wounds of the thorax, seen in a hospital working as a casualty clearing station, is described.

The intrathoracic sequels of these wounds were: haemothorax, 69.4%; pneumothorax, 3.9%; pulmonary haematoma, 11%; atelectasis, 3.9%; lung abscess, 1.6%; thoraco-abdominal injuries, 10.2%.

The early treatment of these conditions is discussed.

A plea is entered for the conservative treatment of the parietal thoracic wound in casualties of this type.

My thanks are due to the Director of Medical Services, Middle East Force, for permission to publish this paper.

VISCERAL LEISHMANIASIS (KALA-AZAR) IN AN ADULT CONTRACTED IN MALTA

BY

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AND

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Although the occurrence in adults of kala-azar contracted in Malta is categorically denied by Neumann (1930), four cases have been recorded in which the history and the demonstration of leishmania leave no possible doubt as to the identity of the disease or that it was contracted in Malta (Bassett-Smith, 1913, 1914; Kerr, 1918; Walker and Gibson, 1933; Gibson and O'Flynn, 1934). Four further cases have been reported in which the diagnosis was proved but in which the possibility of infection having occurred elsewhere than in Malta cannot be absolutely excluded (Ward, 1916; Kerr, 1918; Bassett-Smith, 1923).

A fifth case falling within the former category has recently been under our care in a Royal Air Force hospital in England, and appears worthy of record not so much on account of its rarity as because it serves to illustrate how an easy diagnosis can be missed through failure to bear in mind the possibility of tropical disease in men returning from service abroad. In this case the splenomegaly, anaemia, and leucopenia with a low-grade pyrexia in a patient recently returned from Malta immediately suggested leishmaniasis, and enabled a positive diagnosis to be made and treatment to be started without delay.

Case Report

The patient was an air-gunner who in 1938, at the age of 20, proceeded to Malta, where he remained until he returned to this country at the end of his tour of duty in Jan., 1942. Although he had lived in Egypt and New Zealand in early childhood (1919 to 1926), he had not subsequently been out of England until his present tour, during which Malta was the only place visited. He remained fit until Dec., 1940, when he was admitted to hospital with a urethral discharge which proved to be non-gonococcal and very resistant to treatment. This persisted until July, 1941, and has relapsed periodically since then. In July, 1941, he started to have vague headaches, night sweats, and a troublesome cough, and was readmitted to hospital. Here he was found to have slight fever with a mild anaemia (4.6 millions) and leucopenia (5,800). Radiographs of the chest were normal, but it was noted that 2 st. in weight had been lost in the preceding four months. No definite diagnosis appears to have been made. It is of interest to note that during the preceding six months he had often been sleeping in air-raid shelters in various parts of the island without a sandfly net, that he recalls being repeatedly bitten by sandflies, and that he was in the habit of allowing a dog to sleep on his bed.

By the early autumn of 1941 he was flying again, but still felt "groggy," complaining of a dry irritating cough, frequent night sweats, catarrh, and tender epitrochlear, cervical, and inguinal glands. Several medical officers of all three fighting Services to whom he reported these symptoms did not apparently take them seriously, and he felt that he was suspected of malingering—so much so that he became embittered and lost confidence in himself, to the further detriment of his efficiency in the air.

After several short periods of non-effectiveness he returned direct to England at the end of his tour in Jan., 1942. During disembarkation leave he called in a local practitioner, who, after making an initial diagnosis of influenza, referred him to the medical consultant at a neighbouring civilian hospital. Here all investigations are stated to have proved negative (although a leucopenia of 5,600 with a relative lymphocytosis of 42% was recorded), and he was certified fit to return to duty.

On April 7, 1942, the patient was admitted to a Royal Air Force hospital for investigation. On admission he was seen to be pale, thin, worried-looking, and obviously ill. He had a dry irritating cough which kept him (and the rest of the ward) awake at night. The scanty sputum was repeatedly negative for tubercle bacilli, but there was clinical and radiological evidence of an imperfectly resolved right basal pneumonia. A few discrete cervical, epitrochlear, and inguinal glands were palpable and the gums were tender and bled easily. The spleen was enlarged three fingerbreadths below the costal margin, but was soft and the edge was not easily palpated. No other clinical abnormalities were found. There was a marked anaemia (3.5 millions, Hb 8.7 g.), and leucopenia (3,600) with a relative lymphocytosis of 47%. No leishmania or plasmodia were found in blood smears. The erythrocyte sedimentation rate (Westergren) was 60 mm. in the first hour. Agglutination tests against *Br. melitensis* and *Br. abortus*, Kahn test, Wassermann reaction, and gonococcal-fixation tests were all negative. Napier's formol-gel test became positive only after several hours. A provisional diagnosis of kala-azar was made.

After ten days of postural drainage the pneumonia had completely resolved, but pyrexia persisted, reaching 100–101° F. in the evening and falling to 98–99° F. in the morning. The typical "double peak" was rarely apparent, but the temperature was not recorded throughout the night.

On April 24 sternal puncture was performed and very numerous leishmania were found in the marrow smear, and were successfully cultured on Adler's medium. Leishmania were cultured also from venous blood at this time, although they were not found then or at any other period in blood smears even after prolonged search. At the same time a gland was removed from the groin, smears and sections of which revealed numerous leishmania. Sections of skin removed with the gland showed no leishmania.

From May 5 to 16 a course of 2.5 g. of neostam was given in daily intravenous injections, increasing from 0.05 g. to 0.3 g. The full course of 4.5 g. could not be completed owing to the distressing cough (chiefly at night), which was quite uncontrollable even with heroin. During the week following this course the fever declined somewhat, the spleen became appreciably harder and smaller, and the leucocyte count improved slightly (4,300). On May 29 numerous leishmania were still present in smears of sternal marrow, and so between June 6 and 25 a further 1.85 g. of neostam was administered in doses not exceeding 0.2 g. With this dosage the cough was a good deal less troublesome. On June 30 only a few degenerate leishmania were seen in sternal marrow and there was further slight improvement in the leucocyte count (4,800) and in the general clinical condition, although there was occasional evening pyrexia. A month's sick leave was then granted before deciding on further treatment.

On his return to hospital on Aug. 6 there was no appreciable change in the clinical condition. He reported three rigors and some bleeding from the gums during the preceding week. There was still slight evening pyrexia, with a definite dusky pigmentation of the temples. The blood picture had deteriorated (R.B.C. 3.3 millions, Hb 10.2 g., W.B.C. 2,600). His weight remained unchanged. On Aug. 16 a course of sodium antimony gluconate was started. Daily intravenous injections were given until a total of 86 c.cm. had been administered over a period of 15 days. No cough or other toxic manifestation was observed. Three weeks later the leucocyte count had risen to 5,000, but the anaemia persisted (3.4 millions). An occasional evening pyrexia was recorded, but 99° F. was never exceeded. Another month's sick leave was granted from Sept. 8.

On return from sick leave on Oct. 5 he felt considerably better and had played several games of tennis. A smear of lymph-gland juice was negative for leishmania and the leucocyte count had risen to 6,000, but as the anaemia persisted two pints of packed red cells were transfused on Oct. 15. This resulted in marked improvement, for when he was discharged to light duty on Nov. 4 the red cell count was 4.8 millions, Hb 13 g., and leucocytes 4,800. By Dec. 13 glands and spleen were still palpable and an occasional evening temperature not exceeding 99° F. had been recorded, but the leucocyte count had risen to 7,800 and there was no deterioration in the red cell count and haemoglobin.

The patient was seen again on Feb. 27, 1943. He had then been doing full ground duties for seven weeks and was feeling "perfectly fit." He looked well and had gained 20 lb. in weight. The edge of the spleen could just be felt and there was one palpable epitrochlear gland. The red cell count was unchanged at 4.79 millions, but the Hb had increased to 14.5 g. and the leucocyte count was 10,800 with a normal differential picture. The erythrocyte sedimentation rate (Westergren) was 2 mm. in the first hour. No leishmania were found in smears of peripheral blood or sternal marrow, and cultures from each remain sterile.

It now seems justifiable to regard the case as cured, but the patient is being kept under periodical observation. His return to full flying duties is unfortunately precluded by a dramatic complication, quite unconnected with the leishmaniasis or its treatment, which occurred four days after his resumption of ground duty on Nov. 4. On the afternoon of Nov. 8 he was readmitted to hospital unconscious and with a number of abrasions on the face and head. A history was given of his having suddenly fallen down while walking about the station. Further inquiries suggested epilepsy, and when consciousness was completely regained 48 hours later it was found that there was a short retrograde amnesia, and a history (previously unrevealed) of three similar episodes dating from the age of 14 was obtained. An electro-encephalogram two weeks later was grossly abnormal, and was stated to be typical of epilepsy.

Summary

A case of visceral leishmaniasis (kala-azar) in an adult contracted in Malta is described.

We can trace only four recorded cases in adults whose infection cannot have occurred elsewhere than in Malta.

The syndrome of low-grade fever, cough, adenitis, splenomegaly, and leucopenia was well marked. Nevertheless the disease remained unrecognized and apparently unsuspected for many months both in Malta and after the patient's return to this country.

We express our thanks to Group Capt. W. E. Barnes, commanding the Royal Air Force hospital to which the patient was admitted, for his permission to publish the case; to the staff of the Wellcome Bureau of Scientific Research for their interest and advice; and to Messrs. Burroughs Wellcome for the supply of drugs.

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Barth (*Z. ImmunForsch.*, 1942, **101**, 397) believes that through his culture method (agar with the blood of typhus cases) *Bact. proteus* X 19 acquires special properties. Positive Weil-Felix reaction was obtained with the serum of guinea-pigs inoculated with such a strain, and even with the serum of guinea-pigs inoculated with genuine typhus virus. A positive Weil-Felix reaction occurs not only in the apparent animal disease but also in animals which develop a symptomless or abortive disease. On the basis of the animal experiments, the author believes it will be possible to carry out mass immunizations with this strain against typhus in man.

Medical Memoranda

An Improved Pappenheim Stain for Gonococci

Since the publication in the *B.M.J.* (1943, **1**, 254) of a short article by me, "An Improved Pappenheim Stain for the Detection of Gonococci in Smears of Pus," I have had much correspondence concerning it. Many bacteriologists have obtained good results; others have experienced difficulties. These additional notes may therefore be helpful.

In most instances of difficulty the pyronine in the stain has been thought at fault, but I suggest that it is the methyl green. G. T. Gurr informs me that this dye is more concentrated now than before the war, and it is to be noted that the amount of methyl violet present as an impurity is variable. Gurr originally supplied green and blue-grey batches of methyl green. The blue-grey dye is now obsolete, and some batches apparently contained an excess of methyl violet. It should be observed that the green powder itself turns blue-grey in time on keeping and exposure. Some workers have got good results only by treating the methyl green twice or even three times with chloroform, and this may be accounted for by the presence of an excess of methyl violet in the dye. I have not found more than one extraction necessary, but sometimes have produced a satisfactory stain only by reducing the concentration of the methyl green, and 0.1% may give a good result where 1.0% fails.

Pyronine from different sources has been found suitable, but some batches seem to have a lower dye content than others, as suggested by the differences in intensity of saturated solutions. Grübler's pyronine and pyronine (Conn), which is supplied by the National Aniline and Chemical Co., Inc., New York, yield excellent results.

If a satisfactory stain is not got by a reduction of the concentration of methyl green, proceed further by raising that of the pyronine. In some combinations of methyl green and pyronine, 2 g. or more of the latter may be necessary. A satisfactory stain is obtained when pyronine is present in an amount sufficient to colour the cytoplasm of mononuclear leucocytes in smears a faint pink.

In regard to the keeping quality of the modified Pappenheim stain, it is now possible to confirm that this is indefinite. I still have some prepared in April, 1943, which provides the results described in the original article.

The modified formula that follows is now recommended:

Methyl green (Gurr), chloroform-treated, 0.1–0.5%	100 c.cm.
Methyl alcohol, absolute	10 c.cm.
Pyronine G. (Conn, Grübler, B.D.H., or Gurr) ..	0.5 g. or more
Phenol	1.0 g.
Glycerol	20 c.cm.

ADDENDUM.—A bacteriologist in the Royal Navy has written me his appreciation of the stain, and has remarked that he stains directly with it and not as a counterstain in Gram's method. He claims a big saving in time and material by comparison with other stains for gonococci in smears, and has particularly noted that consistently good results are got even by laboratory assistants without any special staining experience. (I account for these results by stating that it is almost impossible to overstain.)

MAXWELL M. BARRITT, M.Sc., D.Bact., L.M.S.S.A.
City Laboratories, Liverpool.

Long Survival after Hysterectomy for Chorion Epithelioma

The following case is described at the suggestion of Emeritus Professor Ranken Lyle, to whom I am indebted for the details of the previous treatment.

The patient, Mrs. A., aged 35, was admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne, under the care of Dr. Ranken Lyle on Aug. 27, 1910, suffering from hydatidiform mole. Curettage was performed by Dr. Lyle, and she was discharged six days later. Four months afterwards, on Jan. 6, 1911, she was readmitted, and stated that ever since the previous operation she had had a continuous small loss of blood from the vagina. The uterus was not grossly enlarged, and a diagnosis of retained products was made. On Jan. 9 she was again curetted by Dr. Lyle, who removed a few cysts from the uterus. During this operation the uterus was perforated, even though the greatest care was taken. Dr. Lyle considered this highly significant of the presence of chorion epithelioma, and performed an immediate vaginal hysterectomy. The left ovary, which was the size of a pigeon's egg, was removed, but the right, which was normal, was conserved. During the operation a further perforation occurred and a small piece of growth escaped. The uterus, which was slightly enlarged, showed a perforation through the fundus on removal. The patient was discharged from hospital 17 days later. The specimen was reported on by Dr. Stuart McDonald, who stated that the wall of the uterus was extensively invaded by proliferating syncytial cells, and that numerous chorionic villi showing myxomatous degeneration were present. The condition was one of chorion epithelioma.

On Dec. 13, 1943, this patient, now aged 68, attended the out-patient department, bringing with her a letter she had received in 1924, asking her to attend the follow-up department. She explained that she had not been able to attend then owing to a domestic crisis, and apologized for keeping the department waiting 20 years! On examination I could detect no pelvic abnormality. There was no prolapse, and the vaginal vault was smooth and mobile. There were, however, signs of basal cystitis, for which she is now receiving treatment. She is very active, and still does all her own housework.

In would appear that freedom from recurrence for 33 years is sufficient to claim a complete cure.

Newcastle-upon-Tyne. STANLEY WAY, M.R.C.O.G.

An Unusual Swelling on Dorsum of Foot

This case is of interest, first because of the unusual findings at operation, and secondly because it illustrates the difficulty of making diagnoses in China, the land of surprises. The patient was a comparatively well-nourished Chinese soldier aged 48. He came complaining of a painful swelling on the dorsum of his left foot.

CASE HISTORY

The patient had had nothing the matter with his feet until three months before admission. Then, while marching, he experienced a sudden pain in the under-side of his left foot. At the time he was wearing straw sandals, which protected him from sharp flints, etc. When he examined his foot he found no injury, though the pain persisted; the site of this pain was just lateral to the ball of the foot. About a month later he noticed a swelling on the dorsum of the foot; the pain was now referred to this lump, which slowly increased in size.

Examination showed the patient to be well developed. His feet were typical of the ordinary Chinese buck private; the soles were well protected by a horny layer of thick skin, in which were the usual fissures. On the left dorsum an oval-shaped swelling about 1 in. by 2 in., lying in the long axis of the foot, could clearly be seen; it seemed to arise in the space between the extensor tendons of the big and first toes. On palpation it felt rather like a big ganglion, as it was fluctuant; but somehow it gave one the feeling more of soft rubber than of fluid; it was too tense to be a lipoma. Medical opinions were divided between a ganglion and some kind of tumour with cystic degeneration.

Operation.—Under spinal anaesthesia a longitudinal incision was made over the swelling. The tumour was adherent to the tendon sheath of extensor hallucis longus, while the tendon of extensor hallucis brevis appeared to go right through it. At this stage the macroscopic appearance resembled a sarcoma of the extensor sheath. Therefore the part of the tendon buried in the tumour was excised and an attempt was made to dissect out the base of the tumour and remove it *in toto*. Owing to its adherence to all near-by structures, and the lack of any plane of cleavage, the dissection proved difficult. The cyst was punctured and a small amount of thin pus ran out. Finally, as this was almost completed, the whole cause of the trouble became apparent. A large thorn about 1½ in. long protruded from between the metacarpals into this mass of tumour. The thorn was quickly removed, and the area where it lay was curetted. After suturing the stump of the extensor hallucis brevis tendon to that of the longus, the skin was closed round a small rubber drain, which was removed next day. The wound healed by first intention.

The swelling was the result of a reactionary inflammatory process caused by a foreign body—namely, a thorn—which had pierced the sole of the foot three months previously. The thorn had passed upwards between the metatarsals of the big and first toes, and had become encapsulated in the space between the extensor tendons of those toes. The capsule was thick and adherent to the skin, to the sheaths of the extensor tendons, and to the interossei muscles. Inside the capsule was buff-coloured gelatinous degenerating matter. In the centre was a small space occupied by the thorn and a small quantity of grey pus. Owing to the lack of pathological facilities no further examination could be made.

I would like to thank Dr. Robert McClure of the Friends' Ambulance Unit, China Convoy, for his help in preparing this account.

JOHN F. THOMPSON, M.R.C.S.,
Medical Officer, British Red Cross China Unit.

F. L. Munro and H. W. Jones (*Amer. J. med. Sci.*, 1943, **26**, 710), who record three cases in aviation cadets aged from 23 to 26, state that agranulocytosis due to sulphadiazine administration during acute infections may be benefited by subsequent dosage with the same drug. Spontaneous regeneration of polymorphonuclear leucocytes by the depressed bone marrow may occur during the administration of large amounts of sulphadiazine, even though this drug was responsible initially for the depression.

Reviews

BLOOD GROUPS AND TRANSFUSION

Blood Groups and Transfusion. By A. S. Wiener, M.D., serologist and bacteriologist in the office of the Chief Medical Examiner of New York City; head of Transfusion Division, Jewish Hospital of Brooklyn. Third edition. (Pp. 438; illustrated. 41s.) London: Baillière, Tindall and Cox. 1943.

Since it first appeared in 1935 *Blood Groups and Blood Transfusion*, by Alexander S. Wiener, has been the standard work for all interested in the blood groups. There was a second edition in 1939. The outbreak of war and the widespread adoption of "blood banks" in civilian hospitals have led to a greatly increased interest in the subject and stimulated the author to produce a third edition, which has been largely rewritten. The new volume is intended to summarize present knowledge concerning the theory and technique of blood grouping, to present the applications in clinical, legal, and veterinary medicine and in anthropology, and to assemble and integrate the essential facts concerning the transfusion of whole blood, plasma, and serum.

There are two new chapters, one dealing with the transfusion of stored blood and blood derivatives and the other with the recently discovered Rh factor and its role in erythroblastosis foetalis. In discussing the preparation and use of stored blood and derivatives surprisingly little reference has been made to the experience gained in Europe. There is no reference to the work of Greaves and his colleagues at the Serum Drying Unit, Cambridge. Since 1941, in practice concentrated serum or plasma has been given by the usual methods and not by a syringe as recommended by Wiener. It would be extremely difficult to give an adequate dose to a restless shocked casualty with a syringe technique. The chapter dealing with the Rh factor is also disappointing. Our knowledge of this complex and intriguing factor is largely dependent upon the work of Wiener and his colleagues who first discovered it, and one had hoped for a rather more extensive summary of the present position, which is admittedly a constantly changing one. Experience with large-scale blood grouping in this country has demonstrated the wisdom of using as anti-A serum only serum which is known will react with known A_2B cells. Wiener mentions the danger of mistaking AB blood of A_2B subgroup for group B, but does not suggest the remedy that has proved so satisfactory over here. These criticisms, however, sink into insignificance before the debt all interested in the blood groups owe to Alexander Wiener.

CHILD PSYCHOLOGY

The Life of Childhood. A Contribution to Analytical Psychology. By Michael Fordham, M.D. (Pp. 154; illustrated. 15s.) London: Kegan Paul, Trench, Trubner and Co. 1944.

Dr. Fordham is one of the small group of medical psychologists practising in this country who still follow the theories of Jung. He has devoted himself to the treatment of children, and in this book he gives to the world the results of his experience and demonstrates the application of the Jungian philosophy to that experience. His general findings and methods are very similar to those of other workers in child psychiatry, but, as he says, the interpretation of this material in terms of the various schools is rather like the translation of a classical passage into several different languages. Although the basis is common to all, the resultant translations may be very different. The danger is, of course, that the translation may become more concerned with the language into which the material is translated than with the material itself, and the less learned and instructed reader may wonder why it is necessary for the original passage, which he can understand well enough, to be translated at all.

The *motif* of the Jungian translation is the influence of the unconscious, especially that common universal part containing the archetypes of thought and feeling which influence the behaviour and reaction of both parents and child. The author points out that the child is and should be less conscious than the adult, and that treatment will therefore concern itself almost exclusively with the means whereby the child exteriorizes the unconscious—namely, in play, the drawing of pictures, in fantasy and dream. The therapist must meet and co-operate with the child in this *milieu*.

Since so much of the child's behaviour is unconscious, his conduct, whether normal or abnormal, cannot be judged by adult standards. Adults will not be successful in their handling of the child, whether in the nursery or the school, if they are bound by rigid consciously determined rules and formulae. To be successful adult and child must meet on a common ground, and the child must be given an opportunity, generally through play, to work out his inner needs, which he himself does not fully understand. How far, therefore, the child's play should be interpreted to him in conscious formulae, in accordance with this or that school of thought, may be a matter of doubt.

This is an interesting book, sufficiently illustrated by clinical material and by reproductions of children's drawings. It is, moreover, much more readable and comprehensible than most books of the Jungian school, and is to be recommended to all who are interested in child psychiatry. To the ordinary parent the terminology and theory of analytical psychology will probably prove difficult and even misleading.

RACE AND CRIME

Race and Crime. By Willem Adrian Bonger. Translated from the Dutch by Margaret Mathews Hordyk. (Pp. 130; $1.50 or 10s.) New York: Columbia University Press; London: Oxford University Press. 1943.

So many irrational and pernicious doctrines of race have been propagated during the last ten years that a scientific pronouncement on the connexion between race and crime is highly necessary. Prof. Bonger, who died of his own free will a few days after the German torrent had burst into his native country, had been the first leader of criminological thought in the Netherlands and had held the chair of sociology and criminology at the University of Amsterdam until his death. He was a specialist in the sound analysis of statistics, and the leading exponent of the philosophy of crime as a social and not a biological phenomenon. This is a translation of his last book, *Ras en Misdaad*, which was published at Haarlem in 1939. He concludes that no definite results have been obtained in the study of the relationship between race and crime. The anthropology of races is still only in its inception, and the study of the anatomy of the brain cannot yet explain the differences among races which might exist in this regard; nor has scientific psychology gone much further in its study of races; and criminology is also badly informed, for criminal statistics do not as a rule give details of race. Criminality, moreover, he says, is not a characteristic like a round skull or blue eyes. Crime is always limited to a small number of individuals in a race. Often the criminological facts do not accord with what is psychologically known: the Nordic race is violent, but its aggressive criminality in the ordinary sense is small. The Jewish race is unusually subject to neurosis, but Jews commit few crimes of violence. Prof. Bonger emphatically denies any special predisposition for crime, and points out that predisposition is not predestination. His conclusions, based on a large number of case studies, are quite negative, but none the less possess high evidential value. His bibliography, amplified by the translator, is very full.

Notes on Books

In *Man Studies Life: The Story of Biology* (Watts and Co.; 2s. 6d.) Mr. G. N. RIDLEY has attempted, with some success, to compress a large subject within the limit of a hundred small pages. After a short explanation of the science of biology he traces man's study of living organisms from the time of Hippocrates to the present day, devoting the greater part of the book to the advances of the last two centuries. The names and achievements of nearly 160 scientists are mentioned, so that some demand is made upon the absorptive powers of the reader. This book, which includes a glossary and a short well-chosen bibliography, provides a useful introduction to the study of biology.

The *Dentists Register* for 1944 has now been published for the Dental Board by Constable and Co., price 15s. The total number of names appearing on January 1 of this year is 15,404, being 212 more than the figure for 1943. All the new entries added were of persons registered as graduates or licentiates. During the past 20 years the total number on the *Dentists Register* has risen by fewer than 2,000 names.

Preparations and Appliances

A HAND RETRACTION PIECE

Major B. K. RANK, A.A.M.C., writes:

If the apparatus to be described would seem too simple or obvious, description is warranted by its value in operations on the palmar aspect of the hand where any elaborate dissection is indicated, more especially where excision and free grafting procedures are to be done, and also in many cases requiring extensive fasciectomy, tenolysis, tendon repairs, or grafts. The apparatus functions for maintaining hand retraction in a fixed posture, and it acts as a counter-pressure agent where pressure dressings are indicated.

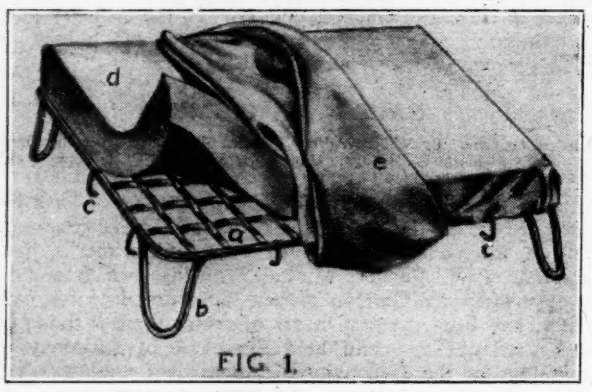

FIG. 1.

Description of Apparatus (see Fig. 1): A wire grill (*a*) approximately 6 in. × 9 in. (e.g., that used as a toaster for a gas-stove) is fitted with corner legs (*b*) about 2 in. high. Distributed at intervals about its rim are several attachments (*c*) to act as hooks for rubber bands. A pack of sorbo rubber (*d*) about 1 in. thick is sewn to the upper surface of the grill. This is covered with a jaconet wrap (*e*) maintained by tapes to prevent undue soiling of the rubber with blood, etc. Several ordinary wide rubber bands complete the requirements. (Fragments of old rubber gloves can be used.)

At Operation (see Fig. 2) the hand is maintained in suitable posture for dissection by arrangement of the rubber bands

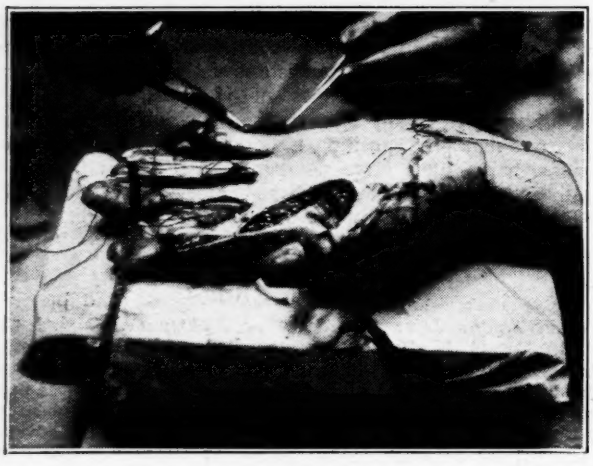
FIG. 2

between the hooks and the fingers; separate bands for the thumb, sometimes for the little finger or for any finger with fixed flexion deformity. This maintains traction on any scar and facilitates incisions and dissections. As scar is removed extension of the finger proceeds by the elastic traction. When the disability is corrected to the indications of the case the corrected posture is maintained by the traction, while patterns can be cut and a graft sutured in with the required finesse without change of posture. Moreover, again without change of posture, the pressure dressing on a graft can be applied by including the whole apparatus in the pressure bandage (see Fig. 3). The size and arrangement of the stand permit of a pressure bandage in any or all directions across the palmar aspect of the hand and fingers so that pressure is evenly distributed by impression of the whole of the dorsum of the hand into the rubber pad. Finger abduction is arranged as desired by wool packed between the fingers. When the dressing is complete the rubber bands maintaining the finger posture can be slipped off or cut; though it is often convenient to leave them attached to the apparatus for replacement at subsequent dressings.

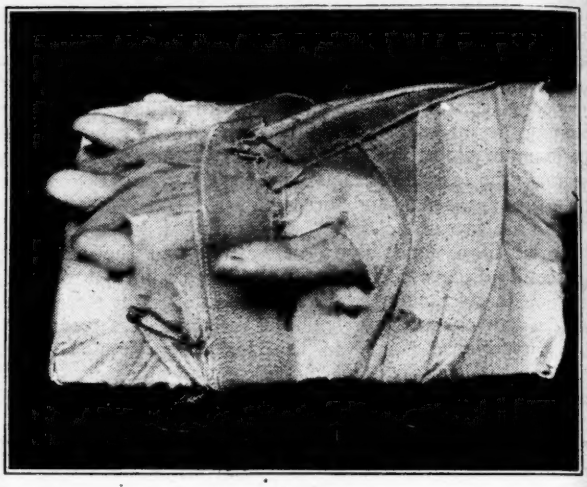
FIG. 3

Advantages of the Apparatus.—(1) Elaborate dissection can be carried out with finger traction maintained and without the cumbersome embarrassment of assistant hands or retractors. (2) An exact and constant posture of the hand can be maintained for long periods during grafting and dressing procedures. (3) Continued or intermittent traction can be arranged for tendon or joint contractions. (4) Pressure dressings are facilitated without undue pressure bearing on vulnerable points, such as the outer sides of the 2nd or 5th metacarpal heads, and without producing cupping of the palm, movement and partial loss of the graft about the inner side of the thenar or hypothenar region. These deficiencies are often seen with round-and-round crêpe bandages. (5) In post-operative treatment traction can be reapplied and posture need not be disturbed at subsequent dressings. (6) The apparatus is not an expendable entity.

PROTEOLYSED LIVER

There are undoubtedly certain occasions on which it may be convenient to give liver extracts by mouth. Pernicious anaemia of pregnancy and pernicious anaemia with sensitivity to injected liver are examples. Owing to wartime shortages of alcohol and glycerin as well as of liver, oral extracts of liver have been officially banned, but the new process of preparation by means of papain digestion has allowed this ban to be relaxed. "Hepamino" (Evans) is the pioneer preparation of this type, and we can only regret that it has been given such a name. The proper title is proteolysed liver (extractum hepatis proteolysatum), which sufficiently distinguishes it from the dry and the liquid extracts of liver in the ***British Pharmacopoeia***.

SUPPLY OF THIOURACIL

Organon Laboratories, Ltd. (Brettenham House, Lancaster Place, W.C.2) announce that they have prepared thiouracil and several of its derivatives in tablets for oral use, and would welcome inquiries from medical men who would like to try these substances under suitably controlled conditions.

Genatosan Ltd. (Loughborough, Leicestershire) announce that they have now prepared thiouracil and that it is available in tablets containing 1½ grains for oral use in the treatment of thyrotoxicosis. They also supply thiourea in tablets of 5 grains for the same purpose.

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CROSS-INFECTION IN HOSPITALS

The treatment of illness in hospital rather than in the home has many advantages. It also has one serious drawback. This is the risk—sometimes slight, but in some classes of patient genuine and ever-present—of acquiring a fresh infection. To suppose that the great reforms of the latter part of the nineteenth century did away with this risk or even reduced it to minor proportions is a grave mistake. Indeed, next to chemotherapy, perhaps the most important line of medical advance during the past ten years has been the study of cross-infection; and the revelations made have been startling. Systematic bacteriological study, and more exact methods of identifying bacteria, notably the typing of streptococci which we owe to Griffith, have furnished proof that patients in open wards exchange bacteria freely. What was formerly regarded as a series of unfortunate and unconnected accidents is now recognized as a ward epidemic of haemolytic streptococcal infection, taking a variety of forms and possibly continuing with intermissions for months. Though this particular infection has aroused most interest because its migrations were formerly so obscure, it is only one of many which may be spread in a hospital ward. These include diphtheria and other infectious fevers, other infections of the air passages, dysentery, infantile diarrhoea, and other gastro-intestinal infections, various skin diseases, a troublesome example of which is pemphigus in newborn infants, conjunctivitis, and vulvo-vaginitis. The danger is greatest among children, particularly infants, and the ravages of enteritis have often been such that some authorities have questioned the wisdom of treating infants under ordinary hospital conditions at all.

The Committee on Preventive Medicine of the Medical Research Council appointed in 1939 a subcommittee on cross-infection in hospital wards, whose report has now been published.[1] A foreword by Sir Wilson Jameson explains that it was at first the purpose of this subcommittee to recommend structural changes in hospitals, but since these are now impracticable the purpose of this memorandum is to secure the desired results so far as may be possible without such changes. The first section—on the prevalence and consequences of cross-infection—is a concise and documented statement of what is now known about the acquisition in hospitals of infections of the respiratory and gastro-intestinal tracts, wounds, and skin and mucous membranes, and forms a serious indictment of present conditions. The second—on sources and modes of infection—illustrated by some telling original diagrams, describes three main routes: droplets and droplet nuclei, dust, and contact, the last being either direct or mediate via clothes, ward articles, food, or insects. These sections occupy six pages. The remaining twenty-two are devoted to practical instructions of every kind for the prevention and control of cross-infection. These range over many aspects of hospital work and are divided into those of general application and those called for in connexion with particular diseases. They include precise instructions for the use of disinfectants for many different purposes—the total of these specified, using either chemical disinfectants or heat, is 29—a full set of rules for barrier nursing, a set of special rules for maternity units, rules for a ward dressing team (based on those given in M.R.C. War Memorandum No. 6), and instructions for treating floors with spindle oil. Among "general administrative procedures" several recommendations are of interest. Hospital structure is the first concern, and here it is stated unequivocally that "the large open undivided ward must be considered as obsolete"; "nearly half the number of beds in a children's or infectious diseases hospital should be in individual cells and the remainder in small units." E.N.T. wards might have been mentioned as requiring the same subdivision. Swabs should be taken on admission from the nose and throat, and from the rectum in children with diarrhoea. Children likely to remain in hospital for some weeks should, if this has not been done, be immunized against diphtheria and possibly against whooping-cough. Visitors to children's wards should be discouraged, parents being afforded ready telephonic response to inquiries instead. That all visitors should wear masks, and, if supplies permit, gowns as well, is perhaps going rather far, but no doubt the public would get accustomed to it in time. Other sensible recommendations are that all kitchen staff should be instructed to report even minor gastro-intestinal disturbances, and that there should be a conspicuous notice in all water-closets: "Next wash your hands!"

The nurse is the person most closely concerned in these matters. A strong point is made of the need for giving the skilled nurse full opportunities for her proper work. This means relieving her of the domestic type of duty, both by labour-saving devices—several useful ones being specifically mentioned—and by allocating some of these duties to ward-maids. A nurse engaged in making up babies' feeds should not be required to change napkins, or otherwise deal with excreta or with septic conditions. Nurses should also receive both theoretical and practical instruction in bacteriology, a set of thirteen exercises for which is detailed in an appendix. This is perhaps the most difficult of all the recommendations to carry out—in large teaching hospitals because classes are themselves large, and in smaller because no teacher may be available. Where it has been done it has nevertheless been found well worth while.

This memorandum, if its value is realized, should have the largest circulation of any of the excellent war publications of the M.R.C. To ensure the application of its precepts a copy ought to be in the hands of every sister of every ward of almost every hospital in the country.

[1] M.R.C. War Memo. No. 11, *The Control of Cross-infection in Hospitals*. H.M.S.O., 1944. (6d.)

DOCTOR AND CORONER

The coroner's office is very ancient, and more important than appears at first sight. His chief duty is to inquire into the cause of a death which may not have been from natural causes or has been attended by suspicious circumstances. His inquest is ordinarily public, and its result is published. He even holds an inquest on the body of a person on whom judicial sentence of death has been executed. He is therefore a powerful bulwark of liberty, for he opposes a constant obstacle to all those, both low and high, who would use murder to forward private ends or public policies. The medical practitioner, through his close professional contact with death, is in a position to give the coroner frequent and valuable help; and this help in the vast majority of cases he gladly gives. Now and again, however, friction arises between these two good public servants. The cause is usually an admirable but, as some think, a misplaced zeal on the coroner's part to inform himself more fully of deaths in hospital. This controversy is old, and is well annotated in "Taylor" and other textbooks of medical jurisprudence. Recently a coroner found it advisable, to enable him (as he judged) better to fulfil his duties, to request the medical staffs of hospitals in his district to report to him all deaths occurring in certain specified circumstances. These included deaths either within 24 hours of an anaesthetic or operation, or before consciousness was fully regained, and deaths within 24 hours of admission to hospital. Some medical officers took strong exception to the request, and consulted their defence societies. Accordingly the Medical Defence Union and the London and Counties Medical Protection Society, desiring to know the exact legal position, framed a set of questions for counsel's opinion. Mr. Roland Burrows, K.C., LL.D., who has had long experience of medical jurisprudence and is president of the Medico-Legal Society, composed an opinion which, in the absence of any judicial authority on these questions, commands the highest respect.

A number of the questions dealt with the hypothetical legal duty of the doctor to report deaths to the coroner. Mr. Burrows answered all these questions with the surprising but convincingly argued opinion that no citizen owes any duty to report to the coroner any death at all. Previously, belief that some such duty existed at common law was almost if not quite unanimous. *Jervis on Coroners*, the best-known textbook, lays down that in all cases of sudden death, or death in suspicious circumstances, where the duty of informing the coroner is not by statute imposed upon any particular person, it is the duty of those about the deceased to give immediate notice to the coroner or his officer, or to the nearest officer of police, who then communicates with the coroner. A Home Office circular issued in 1927, doubtless with the approval of the legal advisers to the Secretary of State, said that if the medical practitioner has any reason to believe that an inquest may be necessary it is "of course" his common-law duty as one of those about the deceased to notify the coroner, his officer, or the police, but he must still certify the cause of death. Mr. Burrows, however, points out that the test of an alleged legal duty is whether it can be enforced. Whenever proceedings have been taken, the offence charged has been that of "obstructing a coroner in his duty." To prove this the prosecution must show that the coroner owed a duty to hold an inquest, and that the accused did something with the intention of preventing the inquest from being held. There is no trace of an individual responsibility based merely on a failure to give information. The doctor is for this purpose an ordinary citizen, as (except in a few special cases, such as death in a mental hospital or a retreat for habitual drunkards) he owes no *statutory* duty to report a death to the coroner. By the Births and Deaths Registration Act, 1926, Sect. 6, the medical practitioner who has attended the deceased in his last illness and can form an opinion on the cause of death must send the certificate to the registrar, and the registrar must report to the coroner any death covered by the long and detailed list contained in the Registration Regulations (S.R.O. 1927, No. 485), which includes the absence of a certificate. Mr. Burrows therefore thinks that the law relies upon the rules governing registration and burial to ensure that the coroner shall receive information, and leaves to the individual conscience of the citizen the decision whether he shall volunteer information.

In asking Mr. Roland Burrows whether a practitioner was entitled to perform a post-mortem examination in given circumstances without the consent of the coroner, the defence societies were evidently misunderstanding the position. Mr. Burrows replied that the coroner's consent is never necessary, but that he may direct or request a necropsy under the Coroners (Amendment) Act, 1926. For the rest he gave the interesting opinion that the only examination that can lawfully be made is one under Sect. 7 or 8 of the Anatomy Act, 1932, the legality of which does not depend on whether the cause of death is known or in doubt. This, he explained, is not a full post-mortem examination but an "anatomical" examination, which he takes to mean a full visual examination of all parts of the body. Doubtless many medical practitioners would have liked him to enlarge a little on this question, for his words appear to imply that the universal practice in hospitals of holding post-mortem examinations for scientific purposes is illegal. The summary which he authorized and which appeared in the *Journal* for Nov. 27, 1943 (p. 694), makes the matter easier: a practitioner may, he says, make a post-mortem examination with the consent of the deceased's relatives, whether or not he knows the cause of death, unless by so doing he knowingly hinders the coroner in carrying out his duties. As soon, however, as it comes to his knowledge that the coroner has been informed from any source touching the death he should on no account make any examination without instruction from the coroner. The coroner's consent, in other words, may technically not be necessary, but it is sometimes just as well to get his *nihil obstat*.

At law, then, if Mr. Burrows is right (and in the absence of authority it is really an open question), the doctor need not report any death to the coroner, but should merely certify according to the Registration Acts and send the certificate to the registrar. Socially and morally, however,

he may often owe a duty to inform the coroner direct. Both the defence societies and Mr. Burrows emphasize this far more important aspect of the matter. Doctor and coroner are alike servants of the public, and their service will be better if they co-operate. The registrar is not a swift channel of information, nor is he medically qualified. To leave him to sift the matter means further delay and distress to relatives who probably have enough to bear already. The custom whereby the doctor informs the coroner direct of facts which should put him on inquiry is a good one, and Mr. Burrows's opinion does not suggest that it should be modified by a hair's breadth. Harmony between the two will best be maintained if the doctor gives the coroner all the information he feels he can properly give, and the coroner respects the doctor's reasons for wishing to set limits to this concession.

PENICILLIN IN WAR WOUNDS

One reason given for the present non-availability of penicillin to civilians is the prior claim of battle casualties. That penicillin well used at a reasonably early stage can largely overcome sepsis in battle wounds is evident from the report of Florey and Cairns on their experience in Tunisia last summer, which was reviewed in this *Journal* a few months ago.[1] It is evidently intended that as many casualties as possible in forthcoming operations shall have the benefit of this discovery, since the Medical Research Council has now published a memorandum of practical instructions solely for treating battle wounds of various kinds with penicillin.[2] This has been drawn up by the Penicillin Clinical Trials Committee, who acknowledge their indebtedness to Florey and Cairns for much of the essential information on the technique of actual treatment, and indeed quote freely from the War Office report to which we have already referred. This is the first manual of instructions for penicillin treatment to become generally available, and may be found useful to those so fortunate as to have penicillin at their disposal for other purposes, since some of the information given is necessary for any form of treatment. The memorandum consists of three parts. The first describes the preparation of penicillin for use: the solid as supplied may be either diluted with sulphanilamide as a powder, dissolved in sterile water to furnish solutions of various strengths, or incorporated in a cream. It is emphasized that penicillin is unstable, and various precautions are needed both to ensure that activity shall not be lost and to prevent contamination. The instructions for actual use reproduce in the main the recommendations of Florey and Cairns for the treatment of soft-tissue wounds and compound fractures—namely, suture and local treatment for the former, and suture when possible and a short course of systemic treatment for the latter. Special types of wound and of wound infection, and burns, are dealt with more briefly. A final section deals fully with the laboratory control of treatment. This involves determining the susceptibility of the bacteria concerned to penicillin, estimating the penicillin content of wound fluid after local treatment, estimating the penicillin content of blood, and titrating the potency of penicillin itself should this be suspect. Several methods for some of these proceedings are given. There is a useful list of classified references to the principal papers on the subject, with their titles.

[1] *British Medical Journal*, 1943, **2**, 755.

[2] M.R.C. War Memo, No. 12, *The Use of Penicillin in Treating War Wounds*, H.M.S.O. 1944. (3d.)

CLASSIFICATION OF DISEASES AND INJURIES

The truism that the more accurate the data submitted to analysis the greater the probability that a skilful analyst will reach accurate conclusions applies with peculiar force to the work of a medical statistician, because his data consist of other men's opinions the correctness of which he *may* doubt but must, in his arithmetical operations, assume. It is true, of course, that statisticians of genius, the Graunts and Farrs, have often profitably used data which duller men supposed not to be worth the trouble of analysing, and also true, as Farr said, that an elaborate nomenclature is not enough to guarantee exact statistical data. But in this and other civilized countries a large proportion of the graver forms of sickness and injury come under observation in hospitals and institutions, in which the combined skills of experts in different branches of medical knowledge enable a precise statement of the facts to be made. The object of the volume published by the Medical Research Council[1] is to make data obtained in this way available for the advancement of medical science by statistical analysis. A work of this kind cannot make a wide appeal; a reader who opens it at random and discovers that a "soldier, with an infected ununited compound fracture of the humerus (the infection being staphylococcal) consequent on an accident while playing football on leave, is coded I=84(3V)2VX–4X: II=686–2, or, on machine

XX
VV

cards, I=8 4 3 2 4: II=686–2," may not be deeply interested. He should, however, reflect that the compilation of a dictionary is of great value to those who have to translate from one language into another, although the result is of little interest to others. The analogy is incomplete, because in the case before us there are not two but three operations: translation from a language we know into a strange language; grouping of the translated words; presentation of the results in the known language.

Only a small number of medical readers will wish or are even competent to criticize the first operation in this series. Many medical readers are, however, competent to criticize the preliminary choice of terms to be translated. Both in the preface and in the body of the work the provisional nature of the classification is emphasized.

> "The present classification must be regarded as experimental, and liable to be modified after practical trial. Expert opinions regarding heart diseases and psychoneuroses, for example, are so conflicting that only tentative groupings could be made, and the classification of heart diseases on pp. 45 and 46 below was framed deliberately so as to obtain some of the information needed before a satisfactory grouping can be evolved."

We have no doubt that the invitation given in this passage will be accepted. One caution may be offered to those who accept it. The final object of this preparation is statistical—viz., the elucidation of group phenomena. This means that a number of individual records are merged to provide some index or characteristic of the group, with the consequence that some personal differentiae are lost. All soldiers with infected ununited compound fractures of the humerus, the infection of staphylococcal origin consequent on football accidents sustained on leave will be coded as described, although no doubt an expert could classify these fractures and the circumstances under which they were sustained into many subgroups. But there is no end to this process, and eventually one may find that the number of groups is coextensive with the number of individuals—the heap of stones has been resolved into its separate stones. One is reminded of Walter Bagehot's defence of party government: that, without it, to each motion in the House of

[1] Special Report Series, No. 248. H.M.S.O. (3s.)

Commons there would be 640 amendments, none of which would be carried, nor the original motion. That is a reason for thinking carefully before adding to the list of diagnoses to be translated. The introduction of machinery has enormously reduced the time and labour required for tabulation; and, we may hope, team work will enormously increase the data available for tabulation. It is not, however, unduly pessimistic to hold that, with this list as it stands and even nation-wide data, a very long time must pass before complete tabulation would be a statistically profitable enterprise.

The volume is a valuable contribution to the advancement of science; all those intimately associated with the work will approve the expression of indebtedness to Dr. Percy Stocks and Dr. Robb-Smith recorded on the back of the title-page.

TRAUMATIC DEAFNESS

Loss of hearing due to acoustic trauma is recognized as a clinical entity. Since some persons are more liable to traumatic deafness than others, the elimination of such predisposed persons from noisy industry might be an effective prophylactic measure. Persons with a family history of hereditary deafness are likely to suffer, and so also are those with a scarred membrana tympani. Conduction deafness should be a bar to work in noisy occupations, as fixation of the stapes increases the intensity of sounds by bone conduction. It has been suggested that a test of threshold value taken before and again thirty seconds after exposure to an 80-decibel tone at the same frequency (256 dv.) for five minutes might give an indication of individual resistance to the effect of loud sounds. To put this into practice Wilson[1] made observations on 85 recruits at an Army training centre before and after firing. In 27 of these there was a rise in the threshold for hearing after subjection to the fatiguing tone, while in 58 there was not. Twenty-one out of the 27 showed a hearing loss on return from firing later, while 6 had the same threshold before and after firing. Ten only of the 58 who had not been affected by the fatiguing tone had a rise in threshold after firing, while 48 did not. There were thus 31 cases with a loss of hearing after firing, and on re-examination one or two weeks later 15 out of 16 re-examined still showed some loss. These results, which may be found analysed in more detail in the original paper by Wilson, give support to the argument that impaired hearing predisposes to an increased susceptibility to acoustic trauma, and it also appears that the ears of some persons are more easily fatigued and are more susceptible to acoustic trauma than those of others. It is suggested that this relation between a liability to auditory fatigue and to traumatic deafness may be employed as a test for predisposition to the latter. In this way susceptible individuals may be recognized and eliminated from occupations in which noise may have an injurious effect on the hearing.

LUNG FLUKES

Human cases of paragonimiasis appear to be rarities in countries other than China, Formosa, Japan, and the Philippine Islands; and the recent record of an indigenous case in Nigeria[2] is of interest both in extending the known distribution of *Paragonimus westermanii* and in reminding the medical profession that either or both pulmonary and cerebral symptoms may be caused by this parasite. In the Nigerian case pus from a cyst in the left sterno-mastoid contained the characteristic operculated ova, while none were seen in the sputum. Apparently the flukes had penetrated the central nervous system eleven years previously, when a fit was followed by symptoms of cerebral lesions. The other African records are from Tripoli, the British Cameroons, the Belgian Congo, and from a much-travelled Arab. No cases have been reported from European countries, though the possibility of its becoming endemic is now present with the invasion of the rivers by the mitten crab, *Eriocheir sinensis*, the second intermediate host. As in America, another snail might deputize for *Melania* (the first intermediate host in the Far East), and a reservoir host, the musk rat, is already present. *Paragonimus* ova, expectorated in sputum or passed in the faeces, on reaching the snail hatch out and multiply internally, resulting in a large number of active cercariae. These escape into the water and bore their way into certain species of crustacea, where they encyst. It is this stage which is infective to man, when crayfish or crabs are eaten raw or undercooked, and to the reservoir hosts—both wild and domestic carnivores such as the musk rat, wild cat, beaver, mink, fox, and tiger, or the rat, cat, dog, and pig. In America, where exceedingly few human cases have been reported, *Paragonimus* has been found in the mink, cat, and dog in many areas. With a review of the world distribution of *Paragonimus*, LaRue and Ameel[3] report its occurrence in crayfish purchased in widely separated localities in North America. In living crayfish the encysted cercariae were recognizable to the naked eye because of their white excretory bladders, in contrast to the yellowish host tissue, and were most numerous around the dorsally situated heart. In preserved crayfish the hearts required to be cleared in phenol in order to reveal the cysts. If a crustacean is very heavily parasitized it is possible that encysted cercariae may fall off the gills and be swallowed in drinking-water. This seems the only explanation of the source of human paragonimiasis in countries where crustacea are not eaten raw or undercooked. A single case of paragonimiasis in a New Britain native was reported[4] before the Japanese invasion, so that it is probable that suitable intermediate hosts are present. A few cases have been reported in Sumatra, Java, Indo-China, Malaya, and India.

Haemoptysis occurs in a small proportion of cases only, and the diagnosis of paragonimiasis depends on the finding of operculated ova in sputum, faeces, or pus from cysts. Small brown oval worms are found in necropsy material and are usually most numerous in the lungs. *X*-ray examinations are not regarded as a satisfactory diagnosis. The most efficacious treatment so far reported[5] resulted in four cases showing no recurrence of symptoms and two cases relapsing five months after intramuscular injections of prontosil (2.5% to a total of 60 to 165 c.cm.) with intravenous emetine hydrochloride (4% to a total of 12 to 23.5 c.cm.) over a period of 7 to 17 days.

Mr. Somerville Hastings, consulting surgeon to the Ear and Throat Department of the Middlesex Hospital, has been elected Chairman of the London County Council. Mr. Hastings has been Chairman of the Hospitals and Medical Services Committee of the L.C.C. for the past ten years.

Dr. T. L. Hardy will deliver the Croonian Lectures before the Royal College of Physicians of London on Tuesday, May 9, and Thursday, May 11, at 4 p.m., at the College, Pall Mall East. Subject: "Order and Disorder in the Large Intestine."

[1] *Arch. Otolaryngol.*, 1943, **37**, 757.
[2] Yarwood, G. R., and Elmes, B. G. T., *Trans. roy. Soc. trop. Med. Hyg.*, 1943, **36**, 347.
[3] LaRue, G. R., and Ameel, D. J., *J. Parasitol.*, 1937, **23**, 382.
[4] Cilento, R. W., and Backhouse, T. C., *Med. J. Austral.*, 1927, **14**, 79.
[5] Yokogawa, S., Wakisaka, K., and So, K., *J. med. Ass. Formosa*, 1940, **39**, 164.

MANAGEMENT OF A FIELD SURGICAL UNIT

BY

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Much attention has been paid at discussions and in the journals to the purely operative side of forward surgery, but in our opinion the other side, which may be termed loosely the "running of the unit," has been somewhat neglected. When taking a new Field Surgical Unit into the forward areas there are many pitfalls into which the unwary may stumble but which with forewarning can be easily avoided.

The unit to which we belong has been working for a year and has functioned through two campaigns involving three different types of military operations. It is based on the Middle East establishment and carries, in addition to the surgeon and anaesthetist, a corporal operating-room assistant, a lance-corporal clerk, two nursing orderlies, a batman, and two R.A.S.C. drivers. The Middle East scale of equipment is sufficient to provide a complete operating team, but all accommodation of the patients before and after operation and all nursing are provided by the medical formation to which the unit is attached. This equipment can be summarized in the following way. Two tents, one large and one small, are used as a theatre and a sterilizing room. Enough instruments are carried to tackle any case that may arise, but the numbers of these instruments are kept down to a reasonable figure. Tents are also carried to accommodate the personnel. In addition, a reserve of stores—particularly plaster, anaesthetics, and dressings—is taken to deal with about a hundred cases without replenishment. With these provisions a Field Surgical Unit can join a Field Ambulance, a Field Dressing Station, or a Casualty Clearing Station, and provide or supplement the surgical facilities of that unit.

From December, 1942, to June, 1943, our unit was with the Eighth Army during the advance to Tripoli and Tunis. In September, 1943, it accompanied the invasion forces to Salerno. Here the work was of two types—the phase of forming and consolidating the bridgehead and then the subsequent advance through Italy. Under these three varying conditions it has been found that the basic principles—partly learnt by bitter experience and partly handed on to us by our predecessors during the long months of fighting in the desert—have not been found wanting. Minor alterations only have been necessary to cope with the changing conditions.

These principles may be described under the following headings: (1) co-operation with the parent unit; (2) minimizing fatigue; (3) note-recording; (4) extra equipment and comforts.

Co-operation with the Parent Unit

A Field Surgical Unit can be regarded as a graft on to a larger medical formation, and, like a graft, retains its entity but has to fit in with the host; unlike a graft, the host may be changed repeatedly, and the unit must be self-contained but adaptable. We feel that it should be an operating unit, pure and simple, which can handle its own equipment without calling on any outside aid. There is a danger that over-elaboration and attempts to increase the facilities carried and the scope of its capabilities may cause this essential to be forgotten. No host unit welcomes a request for help in setting up a theatre when their personnel are fully engaged in their proper and routine duties. Not all units to which one may be attached will have had previous experience of working with a surgical unit, and, even if they have, every team has its own peculiarities and foibles. We have found every unit with which we have worked more than willing to fall in with the suggestions offered. If these are made right at the beginning co-operation starts on the proper basis and minor frictions and irritations are avoided. There are several points that are always well worth stressing, and they can be divided into two categories—pre-operative and post-operative.

In the pre-operation or resuscitation ward, quite apart from the treatment of shock, much valuable time can be saved by the proper preparation of the patient before he goes into the theatre. This does not mean the whole routine of shaving and washing the affected area—indeed, this is better done under the anaesthetic—but rather attention to the sufficient removal of clothing, the adjustment of clean blankets, and adequate premedication. It is not enough to cut away the sleeve of a shirt or the leg of a trouser; each garment must be removed completely. A blanket which is heavily soiled with blood is a hindrance to resuscitation and a discomfort to the patient after operation; it is much better removed in the pre-operation ward than in the theatre.

Regular pulse and blood-pressure readings form an invaluable guide in assessing the response to resuscitation and the optimum time for operation. Intelligent orderlies can easily be trained to do this and record the readings for each case of any severity. In carrying the patient to and from the theatre we have used our R.A.S.C. personnel. Once they are trained in the routine it makes for greater speed and efficiency. The situation of the pre-operation ward is important. It must be as close as possible to the theatre; directly adjoining it is the ideal. The surgeon will need to make frequent visits between cases to watch both the work still to be done and the progress of the cases still being resuscitated. If these visits involve a long walk down a dark corridor or across the open, tripping over guy ropes at night, there will be increased fatigue, waste and loss of time. It is noticeable how slowly one accommodates to the dark after concentrated work in the theatre.

The post-operation ward, if accommodation allows, should be reserved for the seriously wounded cases which will need special care and attention. If every minor case is sent there, awaiting evacuation, the nursing staff will be unable to devote proper time to the more difficult patients. We have made it a rule to write post-operation instructions in fair detail on the Field Medical Card for all serious cases. Until the orderlies have become accustomed to the methods and routine, frequent visits have to be made to the ward to ensure that all instructions are being carried out. Although the parent unit will usually detail an officer to look after the cases after operation, the responsibility naturally rests with the surgeon.

During a prolonged spell of work there is a great temptation to get away to rest or bed when a lull occurs, and the anxieties and repeated requests for opinion and advice from a ward full of "belly" cases can become a great strain. This almost hour-to-hour supervision must be done, however, if tragedies are to be avoided.

We have found that the orderlies are all keen to learn and soon develop an appreciation of the various procedures. Once this appreciation has been achieved things are easier, but they must be watched very carefully during the interim stage.

Minimizing Fatigue

One of the most pressing problems of forward surgery is the mental and physical fatigue that is inevitable during a heavy rush of casualties extending over several days. This is especially so when the team is the only operating unit attached to a Field Ambulance or Field Dressing Station. When there is more than one team the onset of fatigue can be postponed by adopting the shift system. An operating team can carry on for many hours before the members are so tired that they have to stop from sheer exhaustion, but there is a stage when judgment and operative skill fall far below a satisfactory standard. This acute fatigue must be distinguished from the chronic variety which comes on insidiously after weeks of steady and unrelieved operating.

There are several ways in which the powers of the team can be conserved. It must be realized that it is not only the surgeon who bears the strain but the team as a whole. The operating-room staff will have to spend much time preparing the theatre before operating and cleaning up after the last case. Probably the most important factor is the strict working to a routine. Every man should have his place in the scheme and keep that place. The surgeon will then be able to relax until everything is ready for the start of the actual operation. In a short time the orderlies become remarkably efficient, not only in preparing the patient but also in spotting unadvertised

wounds and subcutaneous foreign bodies. It should only be necessary to tell the O.R.A. the nature of the next case for him to have ready all the routine splinting, plaster slabs, and bandages that will be required. To achieve this routine it is as well to practise during any preliminary training period many of the more important duties. This should include such things as tent-pitching, the off-loading and loading of lorries, the setting up of the theatre, and the preparation and application of some of the larger and more intricate plasters.

Any extraneous noise is distracting, and there should always be at least a short passage and a double screen between the theatre and the ward. While visitors are welcome, we insisted that the numbers of spectators and helpers should be kept down to a minimum. If the case is not a serious one the instruments are used on the cafeteria system: a complete set is laid out on the Mayo table and sufficient taken for the case; this reduces sterilization as much as possible. On the ordinary case we have not found it necessary to have a "washed-up" assistant. With the limited numbers of orderlies available it is better to keep them free to help in moving the patient, put on bandages, or clean and sterilize the instruments used on the previous case. Hot sweet tea is excellent for reviving a flagging team, and a constant supply between cases is most welcome and valuable. (A minor point worth mentioning in this connexion is the desirability of having a latrine fairly close to the theatre.) There is some difference of opinion on the question of using one or two tables. A team working with two tables can achieve a faster rate of turnover but there is a greater strain on all the orderlies. This method is apt to introduce an atmosphere of rush and hurry that must be avoided at all costs. There is a limit to the number of cases that can be cleared in a given time, and working with two tables is liable, in our opinion, to hasten the onset of the danger-point in fatigue.

When working as a solo team it may be difficult to get enough time for sleep. Every lull must be utilized to the full, and even then it may become a matter of short sleeps at irregular intervals. It is important that the men should have sleeping quarters which are close to the theatre and quiet at all times. Rest periods must not be disturbed to allow the men to attend the routine unit meal-times, and the parent unit will usually arrange that something is available at the cook-house at any time. Much of the strain falls on the O.R.A., and we have found that he will benefit by a morning or afternoon right away from the camp every now and then. A trip to the medical stores or with a patient to another medical unit makes a good break. This has the further advantage that it accustoms the other orderlies to working without him, a safeguard in the event of his becoming a casualty.

Note-recording

It need scarcely be pointed out that operation notes must be full, accurate, and easily read. This last requirement is the most difficult; even with the clearest of writing it is not easy to make the essential features of a case stand out from a closely written card. When a convoy arrives at a base hospital a rapid survey of all cases has to be made, and it can be very wearying to read through a long description, trying to pick out the salient points. Typewritten notes with bold underlining of all facts of importance are by far the most satisfactory, and a typewriter, if it can be obtained, is invaluable. A point often overlooked is the filling-in in block capitals of the diagnosis on the envelope. In addition to any relevant special labels we also made a practice of printing on this envelope any special instructions for the medical units on the line of evacuation. As examples of this one may mention such headings as "Suprapubic cystotomy," "Watch circulation in foot," "Potential gas gangrene." This ensures that these points will not be missed.

During operations the unit clerk has a table reserved for his use in the theatre. His duties are: (*a*) To check up the particulars of the patient and discover the time of wounding before the start of the anaesthetic; these are entered in the operating book. (*b*) To type the operation notes as dictated to him during or after the operation. (*c*) To write a short précis in pencil in the operation book. It is more convenient to write up all the cases at the end of a list than at the end of each operation. The space between cases may well be taken up in reviewing the pre-operation ward. It is surprising how easy it is to forget the detail of some of the earlier operations, and these pencil notes are a great help. (*d*) To search the pockets in any discarded clothing, collect the contents, and see that they leave the theatre with the patient.

Extra Equipment and Comforts

In addition to the ordinary scale of active service equipment there are a few extras that make the difference between discomfort and moderate comfort. There are two considerations of importance that are antagonistic to each other. First, the unit must remain mobile and the accommodation on the transport is limited. Any large accumulation of non-essential stores will mean that a corresponding quantity of essentials cannot be carried without overloading the lorries. Secondly, prolonged spells of operating on severe and mutilating wounds are somewhat depressing. The efficiency of the unit will suffer if a few extras are not available to allow recreation, relaxation, and an occasional "brew-up" during quiet times. A personal visit to the N.A.A.F.I. will usually secure sufficient tea, milk, and sugar and other minor comforts. We carry with us a small library for the men, which is changed when possible. Penguin books are a convenient size and can often be exchanged with other units. Gum-boots, a leather jerkin, a small primus stove of the collapsible type, a clasp knife with a strong tin-opener, and a spare roll of toilet paper are all items well worth carrying if they can be obtained.

It is not claimed that this article contains any profound observations or original points—others who have worked in forward areas may disagree with some of our opinions—but it is an attempt to describe some of the things that we did not know when we started out and which we know now. It has been our good fortune to have a close liaison with the units to which we have been attached and the base hospitals to which our cases have gone. We record with great pleasure our thanks for the help that they have given us and the kindness they have shown us. For reasons of security they must remain anonymous. We also wish to record our thanks to Col. C. Donald, Consulting Surgeon, Eighth Army, for his help with this article.

ADDENDUM

The following explanatory note has been added by the Army Medical Department, War Office.—ED., *B.M.J.*

Surgery with a relatively independent mobile team and at a forward centre in the field has always made a strong appeal to the imagination; the views expressed in this article backed up by considerable experience should prove both welcome and valuable at the present time when a considerable number of Army surgeons are posted to Field Surgical Units. It is hoped that this note will assist those who are not conversant with the organization of the forward surgical service in the Army, without detracting from the merits of the article. The lay mind, attracted by the idea of providing expert surgery well forward in the battle zone, is too apt to forget that unless adequate rest and post-operation nursing are also provided the benefits of surgery may be completely lost. Operation is only one stage in the treatment. A proportion of the severely wounded men whom an advanced surgical centre must treat cannot be moved in under seven to ten days without grave risk.

The employment of Field Surgical Units is governed by two definite limitations: (*a*) The unit is designed for operating only; it cannot hold or nurse patients after operation. Consequently, this one-team unit is not self-supporting in the medical sense, although independently mobile; it carries the necessary surgical equipment—a tented theatre, with bivouacs for the personnel—but possesses neither ward accommodation nor staff for post-operation nursing. It must, therefore, be attached to a unit capable of providing both. (*b*) Again, there is a limit to the number of wounded the unit can deal with in any one day. Sixteen to twenty serious wounded may be regarded as a capacity load for 24 hours: of these, the last four or five may have to wait 15 to 16 hours for their turn on the table. Delay of this length may well prejudice their chances of recovery. Herein lies the necessity for good triage. **The unit must not be permitted to become "cluttered up" with patients who can be evacuated.**

Surgical Centres: their Formation and Siting

The term "surgical centre" implies the existence of facilities not only for major surgery but for holding and nursing patients up to 14 days, if necessary. The Forward Centre for the troops of fighting formations is normally formed by a C.C.S. which can provide all the requisite facilities. It carries two surgical teams. Surgical reinforcement is provided as required by attaching Field Surgical Units. An Advanced Centre is established only when the distance between the evacuating units (Field Ambulances) and the Forward Centre is such that the "time-lag" for the serious wounds is beyond the margin of safety. This Centre is formed by attaching two or more Field Surgical Units, usually with a Field Transfusion Unit, to a Field Dressing Station, light section of a C.C.S., or a static Field Ambulance. It is seldom possible to post Army Nursing Officers (Q.A.I.M.N.S.) to an Advanced Centre, so that the standard of nursing and accommodation is not so high as that at the normal centre. These disadvantages are unavoidable: the additional risks are justified and offset by the urgency of the surgery.

Correspondence

Prevalence of Ketosis in Children

SIR,—It is regrettable that following Dr. Evans's excellent description and careful observations in cases of "sick stomach-ache" (March 25, p. 432) it is the end-results that are stressed and treatment advised to neutralize them, while the causative allergic basis is not realized so that the proper prophylactic treatment can be inaugurated.

During the past fifteen years, in dealing with large numbers of allergic children and adults, I have labelled the various symptoms described by Dr. Evans as "abdominal migraine" to indicate the usual sequel. These symptoms occur extremely commonly in everyday practice, and their allergic origin is totally unrecognized. As in most illnesses of young children abdominal symptoms are most obvious, so in the parent's history they predominate—lack of appetite, abdominal pain, nausea, or vomiting, often accompanied by a sudden high temperature up to 104° F. for a few hours. Perhaps only one of these symptoms will be present in each attack, but sooner or later others appear, and new ones may replace former ones. It is only towards puberty that the children voluntarily describe any headache or eye signs, but will admit such much earlier if specially asked. A well-marked family history of migraine, sick headaches, or other allergic conditions can be elicited usually, as well as other allergic conditions in the individual sufferer.

The attacks may be due to a sensitivity to environmental articles (bedding, pillows) if appearing predominantly in the night or on waking, and to foods if in the day. But later most cases show a combination of both groups of allergic factors, and the apparent exciting cause appears to be some non-allergic factor which lessens or depletes the protective adrenaline production—the nervous or physical exhaustion mentioned by Dr. Evans, or, more correctly, a chemical exhaustion. The primary factor is not so much faulty fat metabolism as that the "fatty" foods are those to which children are most commonly allergic—milk and other dairy products, egg, pig products, chocolate, and fish-oil emulsions. Glucose proves beneficial because it provides immediate essential energy, in itself never producing allergic reactions, and diminishing the "acidosis." A high percentage of cases, and especially those with a poor appetite, show a low curve of free hydrochloric acid on fractional gastric analysis.

The most effective treatment in these cases is to skin-test the child to determine the causative allergen and avoid the cause if possible; medicinally, to give, say, to a child of 7 years, 15 m of dilute hydrochloric acid *B.P.* in a wineglassful of water at the beginning of each meal, 1/2 gr. of ephedrine hydrochloride at bedtime, and 3 to 4 tablespoonfuls of glucose a day in drinks. An acute attack can frequently be cut short by a hypodermic injection of 3 to 5 m of adrenaline chloride, 1/1,000 solution, as the intense abdominal pain is due to a spasm of the smooth muscle of the bowel together with some urticarial oedema of the mucous membrane with the consequent retention of faeces. In severe cases of abdominal migraine it has been my custom to give the mothers a note stating in my view the nature of the case, and asking that the appendix be not removed unless there is very evident proof of its inflammation; since when the incidence of useless appendicectomies in these cases has lessened.

Let us recognize the true basis of cyclical vomiting or sick stomach-aches in childhood and prevent the sick headache or migraine of later life, so that the Home Guards of the next war will not be heavily fined for missing a parade on account of a migraine attack, and the consequent indignation caused among Members of Parliament, where so many bad sufferers seem to be congregated, may be allayed.—I am, etc.,

London, W.1. GEORGE BRAY.

First Aid for Burns

SIR,—The letter from Col. Colebrook (March 4) calls for some observations. No clue is given as to the time when Col. Colebrook began this investigation because of "the absence of an agreed policy with regard to the first aid for burns." One had thought that as long ago as 1941 surgeons with wide experience of the treatment of burns and scalds were firmly agreed as to the policy which should be adopted for first-aid treatment—viz., all patients with extensive burns (of more than 5% of body surface), or burns complicated by other injuries or which involve the face, hands, feet, or eyes, should be treated only for shock as a first-aid measure and should receive further treatment at a hospital, to which they should be removed as rapidly as possible. A practical and detailed scheme of first-aid treatment for burns of all types is set out in E.M.S. Memo. No. 7 issued by the Department of Health for Scotland (June, 1941; price 2d.). I am not aware of any knowledge which has since come to hand which does not bear out the principles laid down in this memorandum, apart from the recommendations in it with regard to the use of tannic acid.

It is surprising that the covering of extensive burns with a clean cloth of some kind is not specifically mentioned by Col. Colebrook, in view of the emphasis laid on the danger of contamination by streptococci. It would be interesting to know what is meant by "considerable delay" in the "full-dress treatment" of severe burns. The decision to delay treatment in such cases is a serious responsibility, and such interim treatment as the application of the "Glasgow No. 9 cream" can hardly be called "first aid" under these circumstances. It appears that the potential seriousness of a thermal injury of 10% of the body surface is still imperfectly appreciated. It is not clear on which type of burn the cream may be left for only two days. I should be interested to know whether the extensive clinical trials of the cream included estimation of blood sulphonamide level and tests of liver function.

Finally, one wonders who is to apply the cream as a first-aid dressing. The injunctions regarding the prevention of streptococcal infection are admirable in theory but are evidence of a lack of appreciation of the circumstances under which the cream may be used. Even if the cream is obtainable, such precautions as masking and washing of hands are difficult to observe in the average tenement of a Scottish town, as Col. Colebrook should know from his recent experience in Glasgow, and equally difficult during or after an air raid. Under these circumstances plastering the burn with cream is a waste of time, and must be classed as meddlesome and valueless.—I am, etc.,

Edinburgh. A. W. WILKINSON.

*** We have sent a copy of the above letter to Col. Colebrook, whose reply follows.—ED., *B.M.J.*

SIR,—The investigation of first-aid procedures referred to in the *Journal* (March 4, p. 342) was begun in May, 1942. I had not then heard (nor did I until last week) of the pronouncement (June, 1941) by the Department of Health for Scotland, to which Mr. Wilkinson refers. Unless that pronouncement includes full bacteriological evidence as to the efficacy of the first-aid measures recommended for warding off infection by haemolytic streptococci I still think there was a good case for

the investigation carried out by my colleagues and myself in Glasgow. Even now I maintain that there is no agreed policy with regard to first-aid treatment.

Mr. Wilkinson will find the details he asks for in the full account of our investigations, to be published in the forthcoming (April) issue of the *British Journal of Industrial Medicine*. I agree that the "covering of extensive burns" with a clean cloth is ideal—but is seldom practicable. I also fully agree with him as to the difficulty of applying first-aid treatment in many circumstances. It cannot be too strongly urged that most burns should simply be covered with something sterile, or at least "socially clean," and sent straight to hospital. Well-meaning "first aid" will often do more harm than good if the circumstances do not allow it to be carried out aseptically.—I am, etc.,

Burns Unit, Birmingham Accident Hospital. LEONARD COLEBROOK.

Symptoms of Air in the Mediastinum

SIR,—In your issue of Oct. 23, 1943 (p. 533), a question was asked concerning a patient with a supposed "pleuro-pericardial rub." May I suggest that the signs and symptoms in this patient were quite in accord with those found in benign pneumomediastinum. The sudden onset, the severe substernal pain aggravated by exertion, adventitious sounds over the praecordium (due to the beating of the heart and the movement of the lungs against a pleuro-pericardial fold distended with air bubbles), which altered or disappeared with change in posture, the regression of symptoms within a week or ten days, and the recurrence of the condition are all not only compatible with the diagnosis of air in the mediastinum but might almost be designated as classical features of pneumomediastinum. In the event of a recurrence in this patient or the appearance of similar symptoms in others, an *x*-ray picture should be taken—not the usual antero-posterior one which obscures the presence of air beneath the sternum, but a lateral one, which will reveal the air.

Pneumomediastinum may occur under a wide variety of conditions which fall for the most part into two main categories: (1) excess physical exertion, such as running, lifting heavy weights, straining in any way; the onset may be a day or more after the exertion or immediately following it. (2) Respiratory infections involving atelectasis in some areas of the lung, which areas may be small, with compensatory over-inflation in others. The infection may be very mild, even unsuspected, or it may be severe. A combination of (1) and (2) may occur.

Pneumomediastinum may be benign and clear up spontaneously with reabsorption of the air; it may be followed by a rupture of the mediastinal pleura with a resultant pneumothorax, or of the fascial planes of the neck with a resultant subcutaneous emphysema. It may be fatal if: (1) the contained air does not escape from the mediastinum and raises the pressure there to the point at which circulation through the heart and great vessels of the thorax is dangerously impeded or altogether inhibited; (2) the pneumothorax should prove to be bilateral; (3) if the air in the pleural cavity is under too high a tension. It may be relieved in those cases in which it threatens to be fatal by inserting a hollow needle into the mediastinum at the side of the sternum, or a catheter into the base of the neck and pushing it down to the site of the encapsulated air, thus allowing for its escape. Pneumomediastinum is much more common than is thought, and should be suspected in all such cases as that reported.—I am, etc.,

London, Canada. MADGE T. MACKLIN.

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Medical Research as a Career

SIR,—The improvement that took place in the organization of medical research between 1919 and 1939 was considerable, but everybody will agree that much more should be done. The most urgent need is for personnel of the required standard. At present the recruitment of men and women is extremely haphazard. Generally it happens that an individual who has just finished a house appointment feels an urge to investigate some subject while he is waiting for another appointment. The subject chosen is often one that would employ 50 workers for 50 years. With the help of his late chief he gets a grant or scholarship, and at the end of a year writes a report which is useless, and passes on. In a small percentage of cases the researcher is a rather better man and applies for a larger scholarship, and may work very much on his own for a few more years. Unless he is an exceptionally brilliant man he is unable to go further. Many such people fail because they have not been taught how to do research, and, although research workers, like poets, may be born and not made, both require to be taught their A.B.C. It is a truism that research in these days needs a team with a brilliant leader and less brilliant people to help; but under present conditions none but the most brilliant dares to decide on a career of pure research because of the uncertainty of making a living. Even the most brilliant generally have to have a secondary appointment such as teaching in order to make ends meet.

The remedy for these difficulties is to make medical research a profession. The candidate would apply for admission, and if, on general grounds, he was considered suitable he would be sent to a "recognized" institution where a certain piece of work *would be assigned to him for a year*. If at the end of a year the candidate showed promise, he would be allowed to choose a piece of research that interested him in the same institution or another. At the end of a four-years apprenticeship he would, if considered suitable, be recognized as a member of the research profession. Once admitted to the profession his salary must be assured to him and he must be free to continue his resarch in whatever direction it leads him, even if this necessitates his being moved to another institution; and if the institution cannot afford his special grade the difference must come from a central fund. Competition, with prospects of financial gain, is necessary in most walks of life including the medical profession, but this does not apply to the born research worker. In the case of the latter it is generally necessary to safeguard him from falling into a financial mess, the worry of which will impede his work.

To summarize, therefore, it seems to me that if better and more research is to be obtained the following are essential: (1) an apprenticeship; (2) an assured income; (3) the absence of any obstruction to the flow of research, even if that flow should take an unexpected turn. I fully realize that these essentials do already exist in some institutions, but the number of such institutions is small.—I am, etc.,

London, W.1. MALCOLM DONALDSON.

Returned Prisoners at End of War

SIR,—From my experience of returned prisoners both in this war and the last I offer a few suggestions to remedy the conditions so ably described by Major P. H. Newman in the *Journal* of Jan. 1. The difficulties can be divided into three main groups for treatment in order of importance: (i) psychological, (ii) physiological (gastro-intestinal), (iii) financial.

The immediate desire of all returned prisoners is to see their own families and old localities; this can be provided by sick or privilege leave, but should be limited to a month or six weeks, at the expiration of which reactions set in, so they should report to camps, constructed already all over the country, so that their rehabilitation can start. Their families should be accommodated and accompany them if desired, and live as in married quarters. These camps should be organized by specially selected officers of marked leadership, personality, interested in the object, and endorsed in a superabundance of the "milk of human kindness" and patience. The psychological side should be started and handled by specially trained medical officers, but should not be accentuated or publicized.

The food, its cooking and presentation, should be as individual as possible, but under experienced guidance to reconstitute a delicate and abused digestive system. The organization of the camp should be in the nature of an adventure, and the interest of all be encouraged, the discipline and organization being more on the works' committee idea than the strictness of a Service orderly room.

The financial side is more difficult, but would be worse if the individuals were to compete in the open market, and on

finding their inability to compete with their fellow men would develop a disillusioned, disappointed, aggrieved character at variance with the world. By retaining a man in the Services with his pay and allowances and educating him generally after the A.B.C.A. manner, finding his trade, modernizing him in it by suitable instructors before his release, he will enter the world with a greater confidence in himself and on equal footing as to ability with those more fortunate.

There are two likely factors to upset this Utopia: (i) alcohol, (ii) failure to rouse the initiative, or desire, to work. The first can be overcome by a gradual decrease, either by a system of coupons or by rationing, and making the camp institutes or canteens more attractive, sociable, and comfortable than the outside public-houses. The second is the hardest thing to deal with and will need wiser brains than mine to suggest a method, but it will be a very real state, and there might be a fair number of such cases.—I am, etc.,

C. H. CHAVASSE,
Major, R.A.M.C.

First Aid according to St. John's

SIR,—Like many other doctors who teach and examine in first aid, I have been extremely disappointed that there has been no new edition of the St. John first-aid book since 1939. I wonder how many doctors who have themselves to render first aid to a fractured humerus find three little bits of wood and fasten them round the broken bone? or two pieces of wood for a fracture near the elbow-joint? Is not a simple St. John sling sufficient first-aid treatment for a broken collar-bone? Why should we expect to arrest arterial haemorrhage from the palm of the hand by compressing the radial and ulnar arteries when it is known that the interosseous artery continues to supply blood when the two former arteries are compressed? Are all the bandages really necessary which are prescribed for a fractured femur? Why is a bandage tied round the chest for a broken rib? Surely the idea is to immobilize the broken side only, and a bandage, if it is tied tight enough, will immobilize both sides. How can one prevent the onset of poisoning by hypnotics by attempting to keep the patient awake and by slapping his face? How can one hope to use alcohol as an antidote for prussic-acid poisoning when that poison acts in about 20 seconds? Why are "first-aiders" required to treat the bites from rabid dogs when there is no rabies in this country? Why is so much emphasis placed on tourniquets when we know from experience in air raids that a tourniquet is very rarely necessary?

The first-aid examination has to be conducted within very rigid limits, in that the examiner has to ask the candidates specified questions, the candidate being expected to reply on the same lines as are found in the book, and has to repeat all this out-of-date treatment for the benefit of the examiner. Moreover, the lecturers in first aid are frightened to advocate the correct treatment if it conflicts with that in the book, for fear that the ensuing examiner should expect the candidate to reply exactly according to the book. In fact, one is really tempted to ask whether the St. John first-aid book was written when the Knights of St. John of Jerusalem were fighting the Saracens!—I am, etc.,

Colchester. M. E. LAMPARD.

Babies in Glass Cages

SIR,—Dr. Clifford Allen underestimates the danger arising out of cross-infections in hospitalized babies. It is an old saying that babies become ill *ex alimentatione* and die *ex infectione*. The prevention of infections is the main aim in the construction of babies' wards. As compared with the paramount importance of infection the problem of "loneliness" is a minor one. The majority of patients in babies' wards are not yet at a sociable age, and those who already show interest in their surroundings find more distraction in the toys, in the work of the nurse and the medical staff than in the sick companions of their room, whom they cannot often even see. Dr. Allen supports his point of view on the authority of Pirquet. Having worked for 21 years at a children's hospital in Vienna may I be allowed to make some remarks with regard to this point. The importance of infections was fully realized by Escherich and Pirquet in the construction of cubicles for contagious diseases. Ten years ago, when Dr. Allen visited Vienna, Pirquet was dead, and it is my belief that Dr. Allen would have obtained different information if he had had the opportunity of interviewing Pirquet personally. The principle of glass cubicles—for which unfortunately the appalling term "glass cages" has been used by two writers—has been approached in Vienna in the Reichsanstalt für Mutter- und Säuglingsfürsorge. Prof. Parsons's plans, according to which the Babies' Block at the Children's Hospital, Birmingham, was constructed, represents a further advance and an improvement on these ideas.—I am, etc.,

Birmingham. H. S. BAAR.

Postgraduate Courses for Service Doctors

SIR,—I wish to join in the plea for postgraduate courses for Service medical officers after the war. As individuals, we are fortunate in being members of a profession, but as doctors among doctors we shall occupy, at the end of hostilities, a very humble position technically. There is an opportunity here for the Government, universities, and teaching hospitals to put into practice the good will and concern for our welfare which are so evident in the speeches and publications of their representatives. In addition, it will help the realization of the ideal of "positive health" by convincing the temporary Service medical officer that the effects of belonging to an age group too young to have specialized have not passed unnoticed by the authorities, and, by giving him some assistance in rescuing himself from a life of medical mediocrity, it will enable him to face his civilian task in a manner which will benefit his patients and his fellow men.—I am, etc.,

DAVID G. SMITH, M.B., CH.B.,
Squadron Leader, R.A.F.

Treatment of Cerebral Malaria

SIR,—As malaria is being much discussed at the present time the following observation may be of general interest.

I have recently observed four cases of cerebral malaria while medical officer of the Northern District of British Honduras, which is a hyperendemic zone of *P. falciparum*. They were all of the violent maniac type, in which it is essential to control the mania before treatment can be adequately given. My experience of such cases is small, and the usual procedure recommended is morphine and/or chloroform to control the mania, which I have tried but found far from satisfactory.

The first case in this group was an adult male Mayan Indian, very violent and quite uncontrollable with my available staff. His temperature was 104° F. and blood smear showed heavy *falciparum* infection. He was obviously very ill. I therefore called upon all my available restraining powers and managed to give him an intravenous injection of sodium pentothal in the same dosage as for a surgical patient. He immediately passed into a deep comfortable sleep. I then gave 10 gr. quinine bihydrochloride intravenously and 10 m adrenaline subcutaneously. The result was that the patient slept soundly for 8 hours, instead of the expected 1 to 1½ on such a dose. On awakening he was perfectly normal. His temperature dropped, and with a course of quinine 10 gr. t.d.s. and atebrin 0.1 g. t.d.s. for 5 days he had no relapse.

I was very struck with this and gave pentothal immediately to the next case to be admitted, with similar results; this blood smear was negative. I repeated this treatment on two more cases whose blood smears were positive. The last one, a boy of 16 years, did not react so well, but the manic stage passed to a comatosed stage which lasted for 3½ days, with slow but eventual recovery; in this case I did repeated lumbar puncture, with intravenous quinine daily for 5 days.

The explanation is probably that there is some dilatation of the cerebral vessels concomitant with a fall in blood pressure brought about by the pentothal, which, with the adrenaline, probably enables the quinine to act more quickly and directly on the parasites. The anaesthetic properties of the sodium pentothal are probably prolonged by the pathologically oedematous state of the brain. Whatever the rationale of this procedure the transformation of the flushed maniac to a state of profound and peaceful sleep, followed by a normal

awakening, is an extremely gratifying one to watch. I regret that I cannot quote the cases in detail, but I am not at the moment in contact with their records.—I am, etc.,

J. ANTHONY GILLETT,
Colonial Medical Service, British Honduras.

Infant Mortality in Scotland

SIR,—Under this heading (March 11, p. 372) Dr. Margaret McGregor advocates the family allowance which was "first sponsored by the Beveridge report." She forgets that it was a feature long before of the Speenhamland system and the old Poor Law, which proved so disastrous both to children and parents that it had to be abruptly discontinued. Dr. Chalmers vehemently denounced the principle as striking at the sanctity of the family, and the report of the 1834 Commission strongly confirmed his charge. Moreover, the policy is implicit in the provision of meals for school-children. Some of us can remember, all of us can refer to the records of, the strenuous debate which raged some sixty-odd years ago on that subject. Many kind people could only see good in the policy; but others, as kind but with more experience and longer vision, as strongly opposed the compulsory provision on the ground that in the end it would be prejudicial to the children; the real remedy was to allow the wages of the parents to continue to increase as they had been doing and as they did do till 1896. That the latter were right seems demonstrated by the much higher survival rate in the later years of childhood and adolescence before 1890 than in this century.

Injudicious kindly legislation can do more harm than deliberate malignity, and the family allowance, seeming so kind, meant so kindly, is really cruel. No one has a right to urge these wild schemes until it is demonstrated that Government expenditure in this century is not responsible for an awful toll of unemployment, only relieved in time of war; for a constant trend to lower wages, again only relieved in wartime; for two formidable rises in phthisis mortality, again only relieved in wartime. That these trends are the reverse of the trend from 1850 to 1895, when Governments first began to assume the role of Providence, should surely make impatient reformers pause before they urge it further on its arrogant course.—I am, etc.,

Sydenham, S.E.24. B. G. M. BASKETT.

Obituary

ALBERT EIDINOW, M.B., B.S.

Dr. Albert Eidinow worked voluntarily in the department of applied physiology at the Medical Research Institute and found evidence that exposure of the skin to ultra-violet rays put up the resistance to staphylococcal infection. At the St. John Clinic and Institute of Physical Medicine he was in charge of the light department and of the pathological laboratory. He was inventive and designed a "daylight" lamp consisting of a long quartz tube giving weak ultra-violet rays, and a number of incandescent lamps hung on each side of this. This lamp gave as near an equivalent to natural sunlight as possible. Flowers and dyes appeared of the same tint under it as under daylight. Such a lamp had its use then in a picture gallery or a milliner's shop. An hour's exposure of the nude body to this lamp gave the same result as a similar exposure to midday summer sun on the seashore. He found this lamp useful in the treatment of psoriasis and cases of lupus in which the local lesion was treated by intense radiation with the Kromayer lamp. He also invented a small ultra-violet lamp which could be introduced into the mouth and used for affections of this and the throat. Members of the theatrical profession gained benefit from this lamp. The general tonic influence of exposure of the skin to ultra-violet rays depended on the production of a slight degree of sunburn erythema followed by desquamation. To keep the skin sensitive he divided the body into four regions, and giving two treatments a week allowed 14 days to elapse before any one area received another exposure. This saved much time in treatment, for otherwise the exposures would have to become longer and longer owing to thickening of the horny layer and pigmentation. For cases of acute neuritis and fibrositis, swollen painful joints, and traumatic effusions he used what seems to be an ideal method of counter-irritation. Over an area of skin eight inches square above the painful part he gave an intensive dose of ultra-violet rays—enough to produce strong sunburn—and then covered the area with elastoplast bandage. The patient was told on no account to touch this for a fortnight. Infra-red treatment could be given through the bandage. For infra-red treatment he used large incandescent lamps focused by a concave metal mirror, recognizing that the red and shortest infra-red rays penetrate the skin deepest. The longer infra-red rays, from sources of dark heat, only warm the surface, whence the heat is conducted in, short-wave diathermy being the only means of securing deep heating. He carried out very successfully the treatment of chronic ulcers of the leg, using ultra-violet rays to clean them and elastoplast bandage, telling the patients to walk about, and also when necessary sealing up enlarged veins. Scores of patients were thereby healed of their long-lasting ulcers.

In the pathological laboratory with a skilled assistant he carried out blood examinations, etc., and made autogenous vaccines. These were made not by heating culture fluids but by exposing them in a quartz flask, which was kept rotating between a pair of mercury vapour lamps, whereby a thin layer was exposed to the lethal effect of the rays. He thought this method, which has been used in the U.S.A., gave a better vaccine. Eidinow took an active part in the postgraduate courses given at the St. John Clinic, and was highly appreciated by patients and students. His contribution to rheumatic diseases will be found in the book published by E. Arndel under that title. He wrote many papers for scientific journals.

LEONARD HILL.

ALFRED ERNEST RUSSELL, M.D., F.R.C.P.

Dr. A. E. Russell, consulting physician to St. Thomas's Hospital and formerly medical referee to the Treasury and to the Civil Service Commission, died at his home at Finchampstead, Berkshire, on March 26.

Born in 1870 the second son of George Russell, he was educated at Roan School, Greenwich, and St. Thomas's Hospital, and graduated M.B. (with gold medal in medicine) in 1894, and B.S. (with gold medal in surgery) in 1895 at the University of London. His early appointments at St. Thomas's were those of house-physician, house-surgeon, demonstrator of physiology, medical registrar, and resident assistant physician; he was also Salters research fellow in pharmacology. He took his M.D.Lond. degree in 1897 and the M.R.C.P. in 1900, and was elected F.R.C.P. in 1908. After a few years as assistant physician to the West London Hospital he was appointed to the visiting staff at St. Thomas's, and on his eventual retirement became consulting physician there. In 1909 he was Goulstonian Lecturer before the Royal College of Physicians, his subject being "Disorders of the Cerebral Circulation and their Clinical Manifestations." He examined for the College in materia medica and in medicine, serving for twelve years in all, and was a Councillor in 1928–30; he also examined in medicine for the Society of Apothecaries. Dr. Russell was the author, with the late Sir Percy Sargent, of the book *Emergencies of Medical Practice*, of which a second edition appeared in 1911, and he contributed frequently to the *St. Thomas's Hospital Reports*. During the last war he held a commission in the R.A.M.C.(T.F.) on the *à la suite* staff of the London Territorial Hospital associated with St. Thomas's.

ALBERT LUCAS, F.R.C.S.

Though he had retired from participation in British Medical Association affairs for many years, the news of the death of Mr. Albert Lucas, formerly of Birmingham, which took place on March 28 at Stratford-on-Avon, will recall to older members a figure at one time prominent in the central work of the Association and a surgeon highly esteemed in the Midlands.

Albert Lucas was born at Bletchley in Buckinghamshire in 1865. He was educated privately, and entered upon the study of medicine at St. Bartholomew's Hospital in 1883, qualifying in 1888, and he obtained the F.R.C.S. in 1891. His early appointments were those of resident medical officer at the Metropolitan Hospital and house-surgeon at Bart's. In 1891 he was appointed resident surgical officer and, two years later, assistant surgeon at the General Hospital, Birmingham. In 1912 he became full surgeon at that hospital, and on his retirement from the active staff in 1925 was elected consulting surgeon. Occasion was then taken to mark his association with the hospital, extending over more than a third of a century, by the presentation of an illuminated address and his portrait in oils. He was also visiting surgeon to the Jaffray Hospital, Erdington, consulting surgeon to the General Hospital, Nuneaton, and to the Birmingham Institution for the Blind, and lecturer in surgery in the dental department of Birmingham University. He was vice-president of the Section of Surgery at the Annual Meeting of the B.M.A. in Liverpool in 1912, and during the last war he had the rank of major, R.A.M.C.(T.), and served the First Southern General Hospital. On his retirement from practice in 1937 many tributes were paid to him in the city where his life work had been done. He was presented by the Lord Mayor with an illuminated address recording in particular his services extending over thirty years as medical adviser to the gas and public works, the water and other departments of the Corporation.

It was in 1909 that Albert Lucas first became a member of the Central Council of the British Medical Association. In 1911 he was honorary general secretary of the Annual Meeting in Birmingham, and to his fine organizing gifts the success of a noteworthy meeting was largely due. He became a representative of his Division in 1913, and so acted at successive Annual Representative Meetings until 1926. In 1922–3 he was president of the Birmingham Branch. His principal services to the Association were rendered on the Journal, Finance, and Central Medical War Committees, where his business ability, firm character, and cool head were of great value, and some years later on the Hospitals Committee. Of the Journal Committee he made an excellent chairman; his business habit of mind was exactly suited to that position during a time of special difficulty. He was chairman of the Journal Committee during the war period, when the *British Medical Journal* had to be carried on with an increasingly depleted staff and, towards the end, with a most inadequate supply of paper of poor quality. Despite all obstacles the *Journal* continued to give to the medical world in general a good account of events and to provide them with reports of the latest advances in military medicine and surgery. The support which the Editor, the late Sir Dawson Williams, received from the then chairman of the Journal Committee was always gratefully remembered and acknowledged. Albert Lucas was one of the least ostentatious of men, content to work behind the scenes for the good of the profession and of the Association of which he was for so many years a loyal member.

Capt. THOMAS MORRIS BEVERIDGE died suddenly on Feb. 12 at Salisbury, Southern Rhodesia. Born at Roseneath, Dunbartonshire, on March 3, 1906, son of the Rev. and Mrs. T. L. Beveridge, his own mother a doctor, he had made up his mind at an early age to follow in her footsteps. He was educated at George Watson's College, Edinburgh, and graduated M.B., Ch.B.Ed. in 1929. After a house-surgeoncy at Barnsley and a short period of work in Glasgow he went out to Livingstonia as a medical missionary. During a spell at home in 1937 he took his D.P.H.Glasgow and then returned to South Africa to work in the City Health Department, Salisbury. He joined the Southern Rhodesian Medical Corps shortly after the outbreak of war. With his generous nature and cheerful disposition he made many friends both at home and abroad. He was very happy in his work and was very proud of his African regiment. He is survived by his wife.

Dr. SIDNEY DUKE TURNER, who died on March 23, will be mourned by a large circle of friends, professional colleagues, and grateful patients. The son of a medical man, he was born at Lewes in 1874. He was educated at Epsom College, passing on to St. Thomas's Hospital, where he qualified as M.R.C.S., L.R.C.P. in 1897, and Durham University. Graduating in 1900 as M.B., B.S. (M.D. in 1902), he went to Purley, and for forty years bore the major share in a large general practice. He was indefatigable in the care of his patients, and most sympathetic in all his dealings with those in trouble, and was rewarded by winning to a remarkable degree their confidence and real affection. He was a sound and well-qualified general physician, specially successful in the treatment of children, and a most skilful and experienced obstetrician. Turner was a man of robust health and abounding energy, and had numerous interests, both professional and social, apart from the duties of his practice. He joined the B.M.A. in 1901 and served as chairman of the Croydon Division in 1930–1. He was surgeon to the Purley War Memorial Hospital from its establishment as a cottage hospital in 1899, and for many years chairman of its committee of management. He was chairman of the local District Nursing Association and took a keen and practical interest in all matters connected with Epsom College and St. Thomas's. There were few local efforts for the social and religious welfare of Purley of which he was not an active supporter; he was founder-member and past president of the Purley Rotary Club and for thirty years churchwarden of the parish church. He was keen on all outdoor sports, a strong tennis player, and enjoyed nothing so much on his free Saturday afternoons as to watch international or interhospital football, or cricket at the Oval. He was compelled under medical advice to retire from private practice just before the outbreak of war, but retained some of his public activities. Increasing ill-health, however, compelled him to relinquish these one by one, but his interest in them remained keen to the end. In 1901 he married Lilian, daughter of Sir James Wainwright, then treasurer of his old hospital, and he leaves a son, Lieut.-Col. Richard Duke Turner, M.D., M.R.C.P., who is now serving in the R.A.M.C., and four daughters.

We regret to announce the death of the Rev. SAMUEL HANNA, B.A., M.B., minister of Berry Street Presbyterian Church, Belfast, since 1912. Hoping to increase his power for good, and with the consent of his parishioners, he took up the study of medicine and graduated at Queen's University, Belfast, in 1926. He was then able, in combination with his duties as a minister, to carry on general practice. Many of his parishioners also came to him for medical advice, so that he was able in a unique way to minister to every side of his patients' need. He is survived by a son, Dr. William Hanna, who is in practice in the city of Belfast.

We have received the following tributes to Acting Wing Cmdr. D. S. BATEMAN, whose death in a flying accident overseas was recorded in our Services column last week:

J. J. C. writes: Donald Bateman was probably more widely known among R.A.F. personnel than any other Volunteer Reserve officer in the medical branch. This arose partly from the fact that he worked in the R.A.F. Officers' Hospital in 1940 and 1941, but mainly as a result of his sensitive and most attractive personality. He took a deep personal interest in all his patients, an interest which extended beyond their medical condition into the broader aspects of their individual personal problems. In consequence many of his patients became, and remained, close personal friends. The news of his premature death will strike a note of sorrow in the hearts of many R.A.F. personnel widely scattered in all parts of the world. Although Donald Bateman at the outbreak of war was practising paediatrics, he had a wide knowledge of general medicine and an excellent clinical judgment. Apart from professional subjects he had a really remarkable diversity of interests, which embraced music, literature, and art. By his friends he will be remembered as a most delightful companion who could talk and argue on any subject. He wrote with ease and facility and might well have made a reputation as a writer, though his only published book is a biography of Lord Moynihan.

C. P. L. writes: We who worked with Donald Bateman for the short time he was on the honorary staff of St. Mary's Hospital, Manchester, had learned to appreciate his merits as a colleague. He was unassuming but quietly efficient and, as we know from his previous work, of an original turn of mind. He was also unselfish and hard working and was beginning to take a large share in routine work and in teaching. His writing had already been considerable. Undoubtedly, his untimely death has robbed our paediatric world in Manchester of one who would have added much to its strength at home and its prestige externally.

K. N. I. writes: Donald Bateman and I went through Oxford and St. Thomas's together. He had strong leanings towards writing, and in the early days discussed giving up medicine more than once. After being housemen at St. Thomas's together, we were appointed paediatric internes to the Bellevue Hospital, New York City, and it was here that Donald first found his real enthusiasm for medicine. He was very fond of children, and their sufferings awoke in him an urgent interest in their relief; I have often seen him make a late round when he was off duty just to see that they were all comfortable. He had a trick of discussing things with children as though

they were grown-up which made him greatly loved—as my own daughters will readily confirm. Our ways have run together ever since; we were in Vienna together, and up to the war were continually meeting. He went into the R.A.F., I into the R.A.M.C.; fate even sent us abroad in the same convoy. I saw him last in 1942 in Iraq, when we spent a week together. He was still the same Donald and had managed to get himself put in charge—in addition to his usual duties—of a hospital for the children of native troops; his entry into the ward was heralded as ever by demonstrations of delight.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on March 11 Daniel Georges Edouard Cordier, formerly Professor of Physiology at the Ecole Nationale Vétérinaire d'Alfort in the University of Paris, received the degree of Master of Arts (*honoris causa*).

The degree of M.Chir. was conferred on A. G. McPherson, and the M.B., B.Chir. on J. S. Pegum, both by proxy.

UNIVERSITY OF LONDON

Prof. J. M. Mackintosh, M.D.Glas., F.R.C.P.Lond.&Ed., D.P.H., has been appointed as from Oct. 1, 1944, to the University Chair of Public Health tenable at the London School of Hygiene and Tropical Medicine. He was formerly Chief Medical Officer to the Department of Health for Scotland and since 1941 has been Professor of Preventive Medicine in the University of Glasgow.

The Services

Col. (local Brig.) G. Covell, C.I.E., V.H.S., and Col. W. R. Stewart, C.I.E., V.H.S., I.M.S., have been appointed Honorary Physicians to the King, in succession to Major-Gen. (local Lieut.-Gen.) Sir G. Jolly, K.C.I.E., and Major-Gen. A. C. Monro, C.B., I.M.S. (ret.), respectively.

CASUALTIES IN THE MEDICAL SERVICES

Prisoners of war.—War Subs. Capts. W. H. McDonald and C. B. Meldrum, R.A.M.C.

Reported missing, believed killed on active service.—Surg. Lieut.-Cmdr. L. Merrill, R.N.

Reported killed in action in Burma.—Capt. J. T. Robinson, R.A.M.C.

Died.—Capt. E. M. Grace, R.A.M.C.

Medical News

Mr. J. Johnston Abraham will give the Thomas Vicary Lecture on "The Early History of Syphilis" at the Royal College of Surgeons of England on Thursday, April 13, at 4 p.m.

At a meeting of the Eugenics Society on Tuesday, April 18, at 5 p.m. in the rooms of the Royal Society, Burlington House, Piccadilly, W., Mr. D. Caradog Jones will speak on "The Standard of Living." All interested in this subject are invited to attend.

At the sessional meeting of the Royal Sanitary Institute to be held on April 26 at 3.30 p.m., Dr. George F. Buchan, M.O.H. for Willesden, will read a paper on "Social Problems and Health"; on May 23 at 2.30 p.m., Mr. H. J. Manzoni, city engineer and surveyor, Birmingham, will read a paper on "Sanitation in Post-war Building." Every Fellow, Member, and Associate of the Institute may introduce one stranger to the sessional meetings.

A meeting, under the chairmanship of the Lord Mayor of London, will be held in furtherance of Hospitals Day, at the Mansion House on Friday, April 28, at 3.30 p.m., when the speakers will be Lord Luke, chairman of Hospitals Day, and Mr. Henry Willink, Minister of Health.

Sir George Elliston, M.P., has been appointed chairman of the Board of Management of the London School of Hygiene and Tropical Medicine in succession to Sir Holburt Waring.

Dr. Christie McGuire of Dooars, Bengal, has prepared a stencilled note on quinine, primarily written for the use of assistant medical officers in tea-garden practice, but the method of preparing quinine sulphate injections may be useful elsewhere. Copies can be had from the Secretary, Indian Tea Association, Royal Exchange, 2, Clive Street, Calcutta.

Medical Notes in Parliament

Penicillin Committee

In the House of Commons on March 22 Sir ANDREW DUNCAN, in reply to Mr. R. Duckworth, who asked about the composition of the Penicillin Committee and what were the connexions in the drug trade of each member, said that Sir Henry Dale, President of the Royal Society, had accepted an invitation to be the chairman of the committee. Mr. Arthur Mortimer, deputy director of medical supplies, Ministry of Supply, until recently the chairman, would act as vice-chairman, and the other members of the committee were: Dr. V. D. Allison, Ministry of Health; Lieut.-Col. H. J. Bensted, Army Medical Department, War Office; Prof. R. V. Christie, Medical Research Council; Prof. A. Fleming, St. Mary's Hospital; Prof. H. W. Florey, School of Pathology, Oxford; Dr. C. R. Harington, Medical Research Council; Dr. I. M. Heilbron, professor of organic chemistry, Imperial College of Science and Technology, and Scientific Adviser to the Ministry of Production; Prof. R. P. Linstead, deputy director of scientific research, Ministry of Supply; Prof. H. Raistrick, London School of Hygiene; Sir Robert Robinson, Dyson Perrins Laboratory, Oxford; and Sir Russell Wilkinson, military medical adviser, Ministry of Supply; together with representatives of firms engaged in the production of penicillin.

Army Leave for Examination Purposes.—On March 28 Mr. LIDDALL asked the Secretary of State for War if a medical officer in the Army with English qualifications must forgo any leave due to him if he wished to sit for Scottish medical examinations. Sir JAMES GRIGG: While a medical officer is not given additional leave, he is allowed to draw on the next period of privilege leave due to him in order to sit for the examination. I need hardly add that these rules apply to all officers, no matter where they have acquired their present qualifications or where they wish to acquire further qualifications.

Chiropody.—On March 28 Mr. SILKIN asked the Minister of Health whether chiropody treatment would be included in the proposed comprehensive medical service; and whether he would, in the meetings he was about to hold with interested parties and organizations, include the two national organizations comprising chiropodists. Mr. WILLINK replied that where the help of a chiropodist was needed in providing the full medical treatment for which the new service would be designed, that help must clearly be enlisted. In so far as any special arrangements were required to secure this, he would not hesitate to consult the appropriate organizations.

Notes in Brief

There are two scales of salary in Nigeria for Government medical officers who are required to have similar minimum professional qualifications: those not domiciled in West Africa and appointed to the Colonial Medical Service start at £660 and rise by increments to £1,200; those domiciled in West Africa and appointed locally start at £400 and rise to £720.

At Dec. 31, 1943, the latest date for which figures are available, the numbers of tuberculosis cases awaiting institutional treatment provided by tuberculosis authorities in England and Wales were 529 children and 2,752 adults. Of these 233 children and 189 adults had non-pulmonary disease.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* there was a general rise in the incidence of infectious diseases. The increases in notifications over last week's totals were: scarlet fever 180, measles 128, whooping-cough 120, acute pneumonia 106, diphtheria 61, dysentery 61. The incidence of measles has risen for ten consecutive weeks, but the disease is prevalent in only a few counties: 1,159 cases, slightly more than one-half of the total, were notified in the four counties of London, Kent, Essex, and Lancashire. The chief fluctuations during the week were in Lancashire, Essex, Middlesex, and London, where the total of notified cases rose by 146, 106, 61, and 42 respectively, and in Norfolk and Wiltshire, where the total of notified cases dropped respectively by 109 and 46. For the sixth consecutive week the notifications of dysentery have exceeded 200. No fresh centre of infection was reported during the week; the total increase was due to higher notifications in established outbreaks. The largest returns were Lancashire 60 (Manchester C.B. 40), London 37, Middlesex 28, Surrey 21, Essex 18, Derbyshire 12, Yorks West Riding 11.

In *Scotland* the weekly total for notifications of diphtheria rose by 44, for dysentery by 42, and for measles by 39. The incidence of diphtheria reverted to the level at which it had been almost constant until the fall during the previous week. The only large new outbreak of dysentery was that of Dumfries County 18. The notifications of dysentery in Glasgow and

Edinburgh were almost doubled, with a total notification of 21 and 18 cases respectively. The largest rise in the local incidence of measles was in Renfrew C., Greenock B., where the cases rose from 14 to 32.

In *Eire* the total weekly incidence of measles fell by 118 cases. A decrease of 69 was recorded in Dublin C.B.

In *Northern Ireland* the incidence of scarlet fever decreased by one-third, 42 cases. 50 of the total of 85 cases were recorded in Belfast C.B.

Smallpox

A mild case of smallpox has been notified in North Dorset, the patient being a woman teacher of one of the Yeovil schools. The source of infection has not been established, but it is understood that the woman visited South Wales a fortnight ago.

Week Ending March 25

The notifications of infectious diseases in England and Wales during the week included: acute pneumonia 1,270, scarlet fever 2,389, whooping-cough 2,244, diphtheria 666, measles 2,759, cerebrospinal fever 101, dysentery 274, smallpox 1, paratyphoid 6, typhoid 9.

Last Winter's Health

In a review of the winter's health at a Press conference last week Sir Wilson Jameson recalled that in the week ended Nov. 20 there were over 100 deaths from influenza in the great towns. In the weeks ended Dec. 11 and 18 deaths were over 1,100. This wave constituted the only influenza epidemic to occur during the war years, the last comparable epidemic being in the winter of 1936–7. As always with influenza, there had been a great deal of respiratory disease such as bronchitis and pneumonia. These were very prevalent at the tail end of the year, particularly before Christmas. There were a large number of deaths, mainly among old people. As a result the December quarter death rate was the highest for any December quarter since 1918. The corrected infant mortality rate for 1943 had been estimated provisionally at 50 ; figures for the earlier years were: 1939, 51 ; 1940, 57 ; 1941, 60 ; and 1942, 51.

A big decline in deaths from diphtheria was recorded in 1942. The provisional figures for 1943 will disclose a new low record, being about 30% lower than in 1942. "This is very good," said Sir Wilson. "The fall in deaths is a definite sign that the great effort to get children immunized throughout the country —a move in which the Press has played no little part—is having an effect."

Referring to the recent outbreak of smallpox in the vicinity of London, Sir Wilson said that, so far as could be judged, no further cases were likely to arise. Activities at the hospital concerned were again normal. He stressed that the amount of work involved even in a small outbreak of this kind was "almost unbelievable." There were eleven cases, but they necessitated a most detailed inquiry into about 3,000 contacts. The movements of each of these 3,000 people had to be checked. Medical officers of health all over the country had to be notified of contacts in their areas. Each person concerned was offered vaccination or re-vaccination. Library books used by contacts had to be traced and if necessary destroyed ; articles of laundry had to be recovered ; there was a search for a barber who had shaved contacts and cut their hair.

Medical Relief in Europe

An outline of the medical aspects of post-war relief in Europe was given by Dr. Melville Mackenzie, one of the Ministry's medical officers, who was chairman of the Medical Advisory Committee of the Inter-Allied Committee for Post-war Requirements. He said that so far as medicine was concerned it was possible to forecast fairly accurately the problems that were likely to arise during the post-war period as the countries of Europe were liberated. In the aftermath of the last war more people died from preventable diseases and starvation than were killed in the war itself. The first problem to be faced was that of malnutrition. Until a reasonable standard of nutrition was achieved it would be very difficult to do effective medical relief work. The second big medical problem would be the re-establishment of medical services. It would also be necessary to convey to the doctors, professors, and medical students of European countries details of the great advances made in medicine during the five years of war. Among these advances were the use of the sulphonamide drugs, penicillin, and mass radiography ; work in connexion with typhus control, etc. Epidemics which were most to be feared so far as Europe was concerned were those of typhus fever—which killed about 5,000,000 people at the end of the last war—and malaria. Before the war there was a very effective system of notifying major epidemic disease from every country in the world. This information covered about 90% of the world's population. The reconstitution of this inter-Government information service would be one of the most urgent pieces of post-war work.

No. 11

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 18.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944 (a)	(b)	(c)	(d)	(e)	1943 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	87	7	22	6	1	95	7	30	2	11
Deaths		2	2				3	3		
Diphtheria	685	33	187	83	39	798	44	180	100	28
Deaths	10	1	1	—	1	15	1	3	1	—
Dysentery	269	37	117	1	—	66	8	26	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	4	—	—	—	—	2	—	—	—	—
Deaths		1					—			
Erysipelas			52	3	2			53	5	5
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				10					16	
Deaths	52	14	11	21	2	59	12	6	10	4
Measles	2,226	286	345	296	2	19,409	1,152	638	8	78
Deaths	3	1	—	3	—	41	5	1	1	1
Ophthalmia neonatorum	85	5	16	—	1	103	6	22	—	—
Deaths										
Paratyphoid fever	5	—	—	—	—	8	—	1	—	—
Deaths	—	—	—		—	—	—	1	—	—
Pneumonia, influenzal*	1,284	86	19	18	5	1,304	75	9	12	12
Deaths (from influenza)	51	7	3	1	1	52	5	2	1	2
Pneumonia, primary			330	32				328	28	
Deaths		80		18	14		48		13	17
Polio-encephalitis, acute	—	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	6	—	1	—	—	3	—	2	3	2
Deaths		—					—			—
Puerperal fever		3	13		—		4	29		1
Deaths										
Puerperal pyrexia†	166	7	11	—	4	173	9	23	2	3
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,395	152	247	22	85	2,160	165	288	48	56
Deaths	2	—	—	—	—	3	—	—	—	—
Smallpox	3	—	—	—	—	—	—	—	—	—
Deaths	—			—	—				—	—
Typhoid fever	6	2	1	1	7	13	—	6	14	3
Deaths	1	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough	2,026	206	130	34	18	2,007	191	253	29	20
Deaths	7	1	1	2	2	13	6	1	4	1
Deaths (0–1 year)	433	65	72	47	31	434	60	79	43	42
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	5,793	1,009	698	262	161	5,395	816	666	259	159
Annual death rate (per 1,000 persons living)			16·0	17·1	‡			15·0	17·0	‡
Live births	7,342	906	915	473	341	6,425	758	934	345	290
Annual rate per 1,000 persons living			18·6	30·9	‡			19·1	22·7	‡
Stillbirths	216	31	40			216	38	40		
Rate per 1,000 total births (including stillborn)			42					41		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Achlorhydria

Q.—*What diet do you recommend for achlorhydria? The patient is unable to tolerate hydrochloric acid.*

A.—Achlorhydria in itself requires no treatment. It is present without symptoms in a large proportion of the population, particularly in the later age groups. If achlorhydria is found in the investigation of a case of dyspepsia it is unlikely that the symptoms are due to lack of HCl or pepsin. The achlorhydria may well be a pure coincidence. On the other hand, achlorhydria may be associated with an active gastritis, and treatment should be directed to that. In pernicious anaemia the dyspepsia is usually relieved by liver treatment, and if it persists cholecystitis or gall-stones should be suspected. The association of achlorhydria with carcinoma of the stomach should be borne in mind. If a diagnosis of achlorhydric gastritis is made, the diet should be adequate in all essentials, digestible, and mechanically non-irritating. Meals should be small and rather dry and intermediate feeds may be taken. In fact, the ordinary Sippy diet for gastric ulcer will serve well with very slight modification. The main difference is that gastric stimulants such as meat extracts, soup, beef tea, marmite, etc., are to be encouraged. Fruit juices are also favoured by some dietitians. As achlorhydria occurs in vitamin-B deficiency it may be well to pay special attention to foods rich in vitamin B, such as liver, oatmeal, beans and peas, and wholemeal bread. So long as the food is properly cooked and served there is no reason why any of these should produce dyspepsia. The main use of hydrochloric acid is in the treatment of diarrhoea associated with achlorhydria, and, if it is not well tolerated, betaine hydrochloride can be tried in a dosage of 7½ to 15 gr. in water after meals.

Life of Ova and Spermatozoa

Q.—*Taking the menstrual cycle as starting from the termination of the last period, and presuming the latter to last 5 days, when is the day of ovulation in (a) a regular cycle of 28 days, and (b) an irregular cycle? What is the duration of life of mobile spermatozoa (a) deposited in the vaginal tract, (b) which find their way to the uterus or Fallopian tubes? What is the duration of life of the ovum?*

A.—Permanent loss of motility is assumed to indicate death of spermatozoa, and, although this may not be true, it is a useful practical criterion. But long before it ceases to be motile a spermatozoon loses its power to fertilize an ovum, and it is presumably the duration of this characteristic which is in question. This is obviously difficult to determine, especially in the human species, and an unequivocal statement is not possible, particularly as spermatozoa probably vary in their inherent viability and the conditions in the female genital tract are not constant (e.g., *p*H). In the human being sperms retain their motility in the vagina for 1/2 to 3 hours only, usually not longer than 2 hours. Their ability to fertilize is lost in a shorter time, and, according to some authorities, within a few minutes. In the cervical canal, uterine cavity, and Fallopian tubes motility is preserved for 4 to 5 days or slightly longer; former statements of 21 days are no longer accepted. Again the power to fertilize is retained for a shorter period; the exact time is unknown, but it is probably about 24 hours or, at the most, 48 hours.

The life of the ovum is also short, and after 24 hours (possibly less) it is no longer capable of being fertilized. Ovulation occurs more constantly in relation to the next period than to the last, and usually 14 ± 1 days before the onset of menstruation. For a regular cycle of 28 days this means 14 ± 1 days from the *onset* of the last period—the count should not be made from the last day of menstruation. When the cycle is so irregular that the onset of the next period cannot be predicted, the time of ovulation cannot be calculated.

High Birth Weights

Q.—*What is the greatest known live birth weight? I (Gold Coast, W. Africa) have just delivered triplets of 4lb. 10 oz., 6 lb., and 6 lb. 4 oz., total 16 lb. 14 oz. All were males, monovular twins and a tertium quid. The singleton was the smallest, and his placenta showed an organized clot with M.T. malarial parasites in a smear.*

A.—A single foetus weighing more than 11 lb. is very rare. Abnormally large babies are often borne by abnormally large women. Statistics concerning large babies do not always distinguish between live and still-births. Williams says that of 25,000 babies born under his supervision the heaviest weighed 14¼ lb. Moss (*British Medical Journal*, 1922, **2**, 643) recorded the delivery of a foetus (stillborn) after difficult forceps extraction weighing no less than 24 lb. 2 oz. This foetus was later shown at the Royal Society of Medicine, and reweighing (after a long period in fixative) recorded more than 23 lb. The combined weight of twins or triplets is often relatively high. The composite weight of the famous Dionne quintuplets five days after birth was 11½ lb. I have knowledge of one case of twins in which the babies weighed 8 lb. 1½ oz. and 7 lb. 3½ oz. respectively (total weight 15 lb. 5 oz.). These children were born alive and survived.

Coronary Thrombosis

Q.—*Lately I have had to deal with an unusual number of cases of coronary thrombosis. What immediate treatment is likely to save life? Why do nitrites give relief in cases of angina pectoris and not in cases of coronary thrombosis in view of the fact that in both conditions lesions of the coronary arteries are frequently present post mortem?*

A.—Nothing is so important in the immediate treatment of a patient with coronary thrombosis as complete immobilization. If up and not too ill to move, he should go to bed and not get out of it. Morphine subcutaneously gr. 1/4 should be given at once, and repeated in 15 to 30 minutes if required and still again, rather than allow the pain to continue. He should avoid unnecessary arm movements, especially stretching out, and he should not shave or wash himself. This implies efficient but not too active nursing. The giving of an enema is taking an unnecessary risk. Glucose drinks are suitable. Oxygen should be given by nasal catheter or by spectacle frame if there is cyanosis. Digitalis is contraindicated unless symptoms or signs of cardiac failure appear.

Nitrites relieve angina of effort by dilating the coronary vessels. This action cannot relieve the pain from a thrombosed coronary artery with its consequent infarct. Besides, the general effect of nitrites in lowering blood pressure is a reason against their use in coronary thrombosis, which itself produces a significant fall.

Disposal of Foetus

Q.—*There is often some doubt as to the correct disposal of the foetus in cases of abortion, miscarriage, and premature confinement. What should be the correct advice in the following circumstances: (1) up to 3 months; (2) from 3 to 6 months; (3) from 6 to 7 months where the foetus may show signs of life though not viable; (4) from 7 months to term, where the child (a) is stillborn, (b) lives for a short time but is not christened; (c) ditto, but is christened (in this case should the parents arrange for a burial service in church?)? Arising from this last, at what stage of development should the parents be advised to arrange for the baptism of a child which may show signs of life but is obviously non-viable? Lastly, at what stage of development should the foetus be registered as a stillbirth?*

A.—The time divisions of the question are not significant. To deal first with stillbirth. A stillborn child is "any child which has issued forth from its mother after the 28th week of pregnancy, and which did not at any time after being completely expelled from its mother breathe or show any other sign of life" (Births and Deaths Registration Act, 1926). The medical practitioner or certified midwife in attendance should issue a certificate of stillbirth to the father or other person entitled to register the birth, but he may only do so if he was present at the birth or if, after examination of the body, he is satisfied that the child was stillborn. He may obtain the forms free from the registrar of the district.

If the period of gestation was less than 28 weeks the stillbirth need not be registered or notified; the practitioner is merely required to give a certificate stating that the child was stillborn. A stillborn child may not be buried in any burial ground without a registrar's certificate or a coroner's order.

For the remainder, the crucial question both at law and in religion is whether the child ever had a separate existence—that is, gave signs of life after being completely free from the mother. If it did so, then both its birth and its death must be registered and the medical practitioner in attendance must give a certificate of cause of death; to dispose of the body without doing so is an offence under the 1926 Act. The law does not inquire whether a child has been baptized or not. The practice of both the Roman Catholic Church and the Church of England is to baptize a child that shows

signs of life even if it is not viable. In Roman practice the baptism is conditional. In both communities it may be performed in case of emergency by any adult lay communicant. If a child has been baptized, it is doubtless the parents' moral duty to see that it is buried with the rites of the Church. If the child has shown no signs of life within the first 28 weeks of pregnancy, it has had no existence at law and may be disposed of in any convenient way. If the medical practitioner is in doubt whether the foetus may be required as evidence in a criminal investigation, he should arrange for its preservation until the police have consented to its removal.

Urethral Discharge

Q.—*What might be the cause of a clear urethral discharge in a young married male? Repeated smear tests and blood tests have been negative for gonococci, and the history is not relevant. May Trichomonas vaginalis be the underlying cause? What is the treatment?*

A.—1. Assuming that not only are gonococci absent but pus cells and other pathogenic organisms as well, a clear urethral discharge may be due to a variety of causes, most of which are relatively unimportant. The discharge may consist of mucus or prostatic secretion and may be indicative merely of excessive secretion from the glands lining the urethra or of prostatorrhoea.

2. It is possible but not probable that *Trichomonas vaginalis* is the cause; this can be decided by examination of a fresh specimen with a dark-ground microscope; in any case *Trichomonas vaginalis* is uncommon in the male and still more rarely causes signs and symptoms.

3. The treatment of *Trichomonas vaginalis* infestation consists in rendering the urine strongly alkaline—e.g., by means of large doses of sodium bicarbonate. The organism cannot persist in an alkaline medium. Should all pathological examinations be negative, it is suggested that a trial be given to a simple alkaline diuretic mixture.

4. On the other hand the discharge may indicate an uncured gonorrhoea or non-gonococcal urethritis; these can be excluded only by careful clinical examination, including urethroscopy and examination of the expressed secretion of Cowper's glands and prostate and seminal vesicles.

Should examination of the patient reveal anything pathological, examination of the wife is indicated.

Sycosis Barbae

Q.—*I should be grateful for your views on the treatment of sycosis.*

A.—If by sycosis is meant a deep staphylococcal infection of the hair (beard and/or moustache), then treatment relies on the mechanical removal of the infected (and other) hairs by forceps, or by *x*-ray depilation under expert supervision. Local antiseptics are mostly without value because they cannot penetrate and reach the deeply placed coccus. An exception to this is found in the benzoyl peroxide and chinosol compound ointment, which should be well rubbed in night and morning. It will be interesting to know if penicillin proves effective.

Pediculosis Pubis

Q.—*Is there any method of treating pediculosis pubis without shaving or the use of irritating substances?*

A.—The following procedure advocated by H. W. Barber satisfies all the requirements. A pad of lint soaked in 1/40 solution of carbolic acid is applied for one hour. This removes and kills parasites and ova. As a precaution a weak ammoniated mercury ointment is thereafter applied for a few days in case some ova have escaped destruction.

INCOME TAX

Purchase of Practice

"J. L." has taken over the practice of a deceased practitioner. Should his assessment be based on the first year of his "new" practice or on his earnings in the last year of his previous practice?

*** The former—i.e., the practice is treated as "new" as from the date of purchase.

Prisoner of War

"A. E." was a prisoner of war from June, 1942, until June, 1943. He received a portion of his pay in Italy (in lire), plus a further payment representing the pay of an Italian officer of similar rank in view of work done as a medical officer. The cost of living in Italy was extremely high, but had to be incurred to ensure ability to perform the work. A claim has been made to deduct a part of such expenses as being incurred "wholly, necessarily, and exclusively in pursuit of the employment," but the claim has been rejected.

*** The Courts have maintained a rigid attitude towards claims to regard ordinary living expenses as providing a foundation for an income-tax allowance. Costs of living differ as between different parts of the United Kingdom, and a salary paid for service abroad—if assessable at all—is assessable in full, notwithstanding high local costs of living. We cannot advise our correspondent to appeal against the decision.

Assistant: Commencement of Liability

"C. F." started professional work in Nov., 1942. He has been assessed simultaneously for the five months to April, 1943, and for the year to April, 1944. Deductions of tax started in Nov., 1943. Is this correct?

*** Yes. The preceding year basis does not apply to the first year's earnings, whether those earnings result from employment or otherwise.

Assistant Paid Weekly

"C. J." is an assistant in general practice paid weekly.

*** He will come under the new "pay-as-you-earn" system as regards payments made to him after April 5, 1944. As he is not a manual wage-earner the "discharge" of the tax assessable for 1943–4 will be on the basis of 7/12ths and not 10/12ths.

Cash Basis: Partner in the Forces

"B. H."—The terms of the partnership deed provide for the bringing into the profits of the practice the Services pay and allowances of a partner serving in the Forces. The inspector of taxes insists on treating this income as assessable separately under Schedule E, and declines to include it as part of the profits assessable under Schedule D on the firm.

*** The arrangement under which the earnings derived from appointments, etc., are included in the Schedule D assessment is ultra-legal, and rests on a concession of long standing. The Inland Revenue authorities, however, have not so far as we know extended it to cover the case of a partner's Service pay, and we do not think that the concession is likely to be extended in that way.

Employment after Demobilization

"R. R." was invalided out of the Forces in Oct., 1943. He did eight weeks' locum work and joined the E.M.S. in Jan., 1944. His earnings in 1943–4 will amount to £467 10s., and he pays £84 in life assurance premiums.

*** He can claim medical subscriptions and car expenses, etc., while on locum work, and may be entitled to a proportion of the uniform allowance for the period in the Forces. The tax chargeable for 1943–4 is apparently in the region of £45.

Sale of Practice

"J. M." sold the "goodwill only" of his practice. The inspector of taxes wants to know how much he received for the sale of the practice. Is he entitled to demand this information?

*** No. In any case the inspector has no statutory authority to ask such questions, but does so by long-standing practice to avoid passing the matter on to the District Commissioners (who *are* entitled to call for evidence) to settle an appeal. This question is apparently directed to ascertaining whether the price received for the goodwill is consistent with the returns made in past years—at least no other reason for it occurs to us—and though there may be no special reason for refusing the information our correspondent is entitled to do so unless and until required by the Commissioners to supply it.

Car Temporarily Laid up

"D. H." normally keeps a car for professional work, but in present conditions has laid it up in a rented garage and uses a motor-cycle. The inspector of taxes has refused to allow the cost of insuring and garaging the car because it is unlicensed.

*** In our opinion the inspector's attitude is wrong and would not be supported by the authorities. We advise "D. H." to put the facts in writing to the Chief Inspector of Taxes, Somerset House, London, W.C.2.

"Pay as you Earn": Locumtenent

"C. H." asks whether under the new arrangements he will have to deduct tax on paying a locumtenent.

*** We think it must be admitted that in strict law a locumtenent is receiving emoluments assessable under Schedule E, and that legally therefore the new arrangements apply. But the position of a locumtenent is peculiar in that it involves such frequent changes of "employer," and in the past that has been recognized by the authorities and the inconvenience which would result from applying a deduction system in such circumstances has been avoided by regarding locumtenents as within Schedule D and dealing with them accordingly. We do not know, but assume that the same course will be followed under the new arrangements. A practitioner employing a locumtenent would be well advised to consult his inspector of taxes on the point.

LETTERS, NOTES, ETC.

Mastoiditis

Mr. G. GORDON MOWAT, F.R.C.S.Ed. (Bolton) writes: I have no doubt that Dr. H. Hilton Brown (March 18, p. 412) writes in good faith, but I cannot allow to go unchallenged his statement that "mastoiditis is not present in the vast majority of cases operated upon." During the present war I have examined many hundreds of cases referred to me on account of chronic discharge from the ears. Most of these are debarred from military service. I think any otologist will agree with me that if these cases had been properly operated upon within six weeks of the discharge commencing they would to-day have a healed drum and normal hearing. Almost any case of mastoiditis will subside without operative treatment, but, nevertheless, infection of the mastoid is present, and the ears continue to discharge.

Polished Rice and Beriberi

Dr. J. LEASK (Ferndown, Dorset) writes: One hears daily of the sufferings from beriberi of our prisoners of war in Japanese hands. I wonder if they could be advised, say, through the medium of the Red Cross, to expose their rice to the sun for a day before cooking. About 40 years ago, when I was in medical charge of H.M. Prison, Singapore, beriberi was rife among the inmates. They were having polished rice in the diet. With the idea of giving them sea air and removal from a possible source of infection a batch of prisoners were transferred to an island in the harbour, where they received precisely similar food to that given in the prison and from the same source. The result was remarkable; no fresh cases occurred on the island and all improved in health. The only difference was that their rice was spread out on mats and exposed to the sun during the day before being cooked. The rice thus irradiated seems to have regained some of its vitamins, for in the light of subsequent discoveries the marked improvement in the cases on the island must have been mainly due to the irradiated rice. Unfortunately all my papers were destroyed by enemy action, so I am unable to give figures, dates, or other details, having to rely on memory only.

A New Test for Acetone

Mr. JOHN INGRAM, F.I.C., biochemist to the Medical Unit, Welsh National School of Medicine, Cardiff, writes: Rothera's test is a satisfactory one for ketosis. It is essential to perform this test in a room that is not used for blood and water analysis, otherwise contamination of the reagents will occur and inaccuracies will result. The new test for acetone bodies is carried out on a dry stable powder, containing sodium carbonate, ammonium sulphate, and sodium nitroprusside. The powder detects the presence or absence of acetone in the urine. The colour reaction is identical to that found in Rothera's test, a delicate permanganate tinge develops, which gradually deepens within two minutes if acetone is present. There are no fallacies and the powder will detect acetone in a dilution, 1 part in 10,000 parts of urine. Reagents are prepared thus: 3 g. of sodium nitroprusside is ground to a powder in a mortar, add 100 g. ammonium sulphate and 50 g. of sodium carbonate anhydrous; mix well in the mortar; keep in a dry wide-mouthed bottle. *Method as Applied to Urine.*—Place a small amount of the powder in a dry test-tube (about half an inch). Saturate the powder with a small amount of urine. If acetone is present, the powder will develop a faint permanganate colour to a deep permanganate colour for larger amounts within two minutes. A brown colour does not constitute a positive reaction. By the use of this powder in clinical laboratory practice the performance of the test is simplicity itself and the cost is almost negligible. The test so performed is thoroughly reliable and very sensitive. It does away with objectionable ammonia.

Quinine Sulphate for Intramuscular Injections

Drs. CHRISTIE MCGUIRE, M. L. CHAKRAVARTY, and G. C. KARMAKAR write from Dooars, Bengal: Owing to the shortage of quinine bihydrochloride we have been using quinine sulphate for intramuscular injections, and our results have been so satisfactory that we desire to bring it to the notice of your readers. During the past 12 months we have given about 6,000 injections and to date we have not had any abscess formation. Some of our patients include infants a month old. We have found that the local tenderness at the site of the injection, which is usually given in the buttocks, and the therapeutic results are similar in all respects to quinine bihydrochloride. Our method of preparation is as follows: (1) Add 100 minims of dilute hydrochloric acid to 10 c.cm. of distilled water and dissolve 100 grains of quinine sulphate in the solution. Then add enough distilled water to make the total quantity 20 c.cm. (2) Filter through filter paper. To prevent the solution from being absorbed into the paper first moisten the paper with distilled water. After filtering boil and keep in a sterile stoppered bottle. The solution is now ready for use. Each 1 c.cm. contains 5 grains of quinine sulphate and the usual adult dose is 2 c.cm. If the solution is not all used the same day and there is any doubt about sterility, the remaining quantity can be boiled again before use. In our experience the efficacy of the quinine is not affected by double boiling. (3) Don't use dilute sulphuric acid for dissolving the quinine sulphate as we have found that after a while the quinine crystallizes to the bottom, but this does not occur with dilute hydrochloric acid.

Treatment of Pregnancy Vomiting

Dr. W. EDWARDS (Ashtead) writes: The vomiting of pregnancy seemed to me so similar to the vomiting induced in some people by synthetic oestrogens that I wondered if the large volume of oestrogens present in the blood in pregnancy might be responsible for the sickness in susceptible women. Whether or not that is so, I have now treated a dozen cases of vomiting, severe enough to make life a misery, by giving a synthetic progesterone in the hope that it might balance things up. I have used "ethisterone" (Boots), one tablet of 10 mg. daily; and every one of these dozen cases cleared up completely in a week and in none did the vomiting recur. It may have been suggestion, or luck, but it would be interesting to know if anyone can confirm these results.

Pin-hole Urinary Meatus

Dr. HENRY A. LAVELLE (Derby) writes: In your issue of Feb. 26 (p. 314) there is a question under the heading "Pin-hole Urinary Meatus." The condition described in the question is not due to the embryological cause given in the answer. It might be as well if the facts were stated. Some children pass a urine which soon becomes very ammoniacal. This gives rise to a napkin rash with blisters which ulcerate in bad cases. If this type of child is circumcised, the meatus, protected up to now, frequently becomes the site of a more or less chronic ulcer. This, by scarring, causes the narrowing. Enuresis, with more prolonged contact with the urine, obviously is a contributory cause when present. Enuresis may also be due in some cases to the ulceration, as the child, when awake, avoids micturition, as it hurts. This pin-hole urinary meatus is the one important bad effect of circumcision. The treatment is to treat the cause, with a meatotomy later if necessary. Prevention is better than cure.

Hyperidrosis: Pruritus

Dr. N. S. FINZI writes: Two of the answers in "Any Questions?" are at variance with radiological experience. (1) *Excessive sweating.*—These cases do extremely well with correct *x*-ray treatment, and I have had no trouble at all, or any failures so far, though some of my cases I have seen more than twenty years after the treatment. I have, however, seen a case of gross damage, but it was not treated by a radiotherapist. A single treatment is usually sufficient. (2) ***Pruritus ani et vulvae.*—*X*-ray treatment in small doses** (about 60 r. a week) will very often completely relieve these patients, though it occasionally fails, especially in the type associated with leucoplakia. Underlying causes must of course be eliminated.

Salt Drink for Cramp

Dr. H. A. DIRCKZE (Wellawatte, Ceylon) writes: I was interested to read two notes on a remedy for cramp on page 402 of the *Journal* of March 27. As a public health officer I have for many years been in charge of ante-natal clinics. A frequent complaint by expectant mothers is that they suffer from nocturnal cramp, especially of the calf muscles. I advise them to drink a glass of water in which half a teaspoonful of common salt is dissolved. One such glass is drunk just before retiring and one is ready by the bed should the cramp come on in spite of the glass already drunk. It has invariably been successful. On one occasion at a tennis tournament a friend of mine who was in the running for the finals developed cramp during a set. He was quite disappointed as he knew from past experience that he would not be able to resume play. I hastily obtained some common salt and dissolved half a teaspoonful in a glass of sweetened lime juice and made him drink it. In a few minutes the cramp disappeared. I gave him another glass of the mixture and he was able to resume his game without recurrence of the cramp. I should mention that the idea came to me because during the D.P.H. course at the London School of Hygiene we were told that the "bends" or severe cramps suffered by stokers on board ship have now been entirely eliminated by giving them normal saline to drink instead of plain water. It was stated that the loss of salt during sweating for some unknown reason (perhaps unknown to me only!) causes cramps in some subjects. I, too, have cured myself in a minute or so of an attack of nocturnal cramp by hastily preparing and quaffing a glass of (more or less) normal saline.

An Answer Corrected

The contributor regrets that his reply to the question on congenital deafness (April 1, p. 481, under the "Any Questions?" section) contains a serious error. *The patient is certainly a carrier.* This, however, does not affect the opinion given as to marriage.